## YOUR GUIDE TOCOMPUTERS UNDER £200 PLUS THE SOFTWARE TO CO WITH THEM




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## Make the most of your micro with these two new books from Newnes Technical Books

## Computing with the Oric 1

Ian Hickman

This new book is for all users of the Oric 1 micro. It complements the Oric Manual and can be used alongside it. An introductory section covers the initial switching-on and setting-up of the micro, followed by some simple BASIC programming. Later chapters introduce more advanced BASIC, high-resolution colour graphics, the sound feature and interfacing, with a special section on the oric printer and another on machine code programming. A number of original programs are included.
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## Peter Lafferty

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## $\mathbb{N}$ ewnes Technical Books

Borough Green, Sevenoaks, Kent TN15 8PH the coveted Grammy awards in California. These awards are to the music industry what Oscars are to the film world. Getting a Grammy means that you really have made an impact on the American music scene. Would British software "acts" receive awards if the American computer industry held a similar ceremony?
Maybe some would, but for now the real answer has to be no. We hear that British software is the best in the world, and even the Americans would acknowledge that when it comes to business software the British have a name for quality. We are known to be especially good at pushing back the frontiers.
British games software has made little impact in the US so far. Jeff Minter is one of the few British names American software buyers recognise. Jeff and his Llamasoft company are successful there because he specialises in software for Commodore micros. Most British software authors write for the Spectrum which doesn't have a large user base over there, and consequently some of our best software never gets looked at by Americans,
Throughout the nation, in bedrooms and garages thousands of would-be programmers are beavering away at their computers, each of them hoping to produce the next blockbuster game.

Just like there are thousand of garage bands for every Beatles or Culture Club, there are a thousand hopefuls for every Jeff Minter. Sooner or later someone is going to have an international hit on their hands. But the real breakthrough will come when British and American users fall into step with their hardware. At the moment they use discs, and we for the most part use tapes to load software, which means the two markets are incompatible.
Nowadays the great innovation is networking. In the States this is commonplace, and people here can now dial-up software via the telephone. When we fully adapt to this technology there can be another British invasion. In the same way that the introduction of cable TV in the USA opened the door for a new wave of British music, The Police, Culture Club and Duran Duran, computer networks present us with another challenge. Who is going to lead the next wave?


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# NFMNS <br> …n................. 

MICRODEAL decided to find out what makes one game disappear from the shelves like free fivers while another will stick around like a wet weekend-away. So Microdeal asked the people who should best
know the answer - the people who buy software.

The graph shows that 400 people thought that "A Genunine Challenge" was the most important aspect of a game; close second was "Life-like Graphics". Right at
the bottom came "Outlet for Aggression"; does that mean that games players are non-aggressive - or that they'll beat your head in when they've had just one more go at Pacman?
 Learning

THE French Mistress is the unlikely sounding title of Kosmos Software's first language learning program. It has been followed up by The German Master, and The Spanish Tutor. All three run on the Acorn Electron, Spectrum 48 K and BBC Micro. Two cassettes are available for each language, level $A$ and $B$. Each one covers a completely different area of grammar and vocabulary, and costs £9.95. The tapes are suitable for students - from beginner at school to university level - as well as businessmen and travellers.
French is Fun and German is Fun don't aim so high; they are for students and people who want to brush up their "Two teas please", before going on holiday. But the tapes

## languages

will teach you general phrases, build
up pictures with their corresponding words displayed in bc h languages, and test you. The tapes cost $£ 5.95$ each, and run on the Spectrum 48 K .
Kindersoft has come up with a multieach, and run on the Spectrum 48 K .
Kindersoft has come up with a multilingual educational program. It
features games designed to help with features games designed to help with addition, subtraction, spelling and the alphabet, and is in five languages, English, French, German, Italian,
and Spanish. It is available for the English, French, German, Italian,
and Spanish. It is available for the CBM 64, Spectrum and Oric/Atmos, price $£ 9.95$.
If you fancy learning a language with the help of your computer, look out for our special language review in next month's issue of Computer Choice.
-


SPECTRUM 4BK $\square$


PHILIPS, not content with a large slice of the regular TV market, is launching a 12 inch high-resolution monitor for exclusive use with home computers. At $£ 69.95$ you'll be able to use it with all leading makes of home and personal computer. At last the rest of your household will get a look-in with the family TV.

## New releases

LIVERPOOL software house, Imagine has come up with some novel ideas designed to entice you into buying its games. The first is an Injectaload program for the Commodore 64, which will make cassette loading as least as fast as disc loading.
Injectaload is a series of machinecode routines which load an entirely new cassette operating system into the CBM 64. This allows 30 K of program to be launched in two minutes instead of the usual 10 to 15. The first game which incorporates this feature is Pedro, Imagine's latest games release, but in future all of their $C B M$ 64 software will include Injectaload.
Pedro is a Mexican gardener who must try and plant seeds in a garden despite frantic intervention from all sorts of garden pests, from ants to galloping donkies. In his defence Pedro can wall them up in a maze at the top of the screen, block their paths with piles of compost, or if the worst comes to the worst, he can stamp on them. It costs $£ 3.95$ and is available not only for the CBM 64, but also for the Spectrum, Dragon, BBC Model B, and Electron.
To help give customers a better idea of the game they are buying, Imagine is changing to a new style cassette insert. All future releases will include two or three actual screen shots of the game, as well as a working description.


Chinese fuggler

## More software

PHOENIX Software has three new games for the CBM 64: The Sorceror's Apprentice, which is very "story book" and even has frogs kissing princesses - or is it the other way round? Attack on Windscale, where 21st century enemies step back in time to attack the atomic power station at Winscale; and It's 1984 very true. These games cost $£ 9.99$ each. If you really are keen on holocausts, try Hell Gate from Llamasoft. Available on both the 8 K expanded Vic and the 64, it is a high speed arcade game with 20 levels of play. The Vic version costs $£ 6$, and the CBM 64 version costs $£ 5$ - watch out for the goats!
If you are rather more down to earth, Plumb Crazy! from Terminal Software is a welcome retreat from star-dazed killo-zapps. Help George, the plumber, stop the hot water tank from blowing up - well, it'll make a change. Price is $£ 7.95$. Ocean has come up with a game from Hungary, Chinese Juggler. You must do the old plate spinning trick, and keep them balanced on eight rods. This will cost you $£ 6.90$.
Two new games from Bubble Bus Software should appeal to younger readers, Flying Feathers and Bumping Buggies. In the first one you are the gamekeeper trying to stop the greedy eagles from taking all the fish from the lake. The second is a motor racing game; both cost $£ 6.99$.
Back to the incredible, with games from Mogul. Fire Ant for the CBM 64 is an arcade game in which you are the last soldier ant left after a scorpion attack. Your task is to rescue the queen ant from their evil clutches. Mushroom Alley makes you the proud owner of a splendid garden, but suddenly you are invaded by wild mushrooms and pests. This is available on the CBM 64, Vic-20 (and Spectrum). Other titles from Mogul
include Cave Kooks and Labyrinth of the Creator on the CBM 64 only; Pengy, save the penguin from the Snow Bees; Chomper Man, on CBM 64 and Vic-20; and Lugwig's Lemon Lazers, on the Vic-20 only. Pengy costs $£ 5.99$, all the others cost $£ 7.95$.
Anyone with a disc drive can try Audiogenic's new range of disc-based games. Initially five games have been launched and cost $£ 12.95$ each. Slinky is a spring and hops onto different coloured blocks that change colour. The blocks belong to the wicked wizard who takes great exception to this sort of behaviour, and battles ensue - all 90 levels of them. Audiogenic likes to think Forbidden Forest is in 4D, presumably because day turns into night. The hero is a champion archer and must fight giant spiders, snakes, skeleton soldiers and the like. The other three disc-based titles are Pegasis, Aztec Challenge and Frantic Freddie. ted on your own.

## Robots anonymous

EVERY way you turn these days somebody is doing something with robots - and now the government's jumping on the bandwagon as well. The Manpower Services Commission, Open Tech Programme is now launching a project that will make robotics training widely available in this country. In conjunction with the Organisation for Rehabilitation through Training (ORT), Open Tech is pioneering a scheme to bring robotic literacy to firms who are


WATCH out for a switched joystick interface for the Electron, it should be in the shops now. Made by FBC, First Byte Computers, it is a plug-in cartridge which takes all standard Atari-style joysticks. It'll cost you £24.95. FBC Systems, 10 Castle Fields, Main Centre, Derby. Tel: Derby 365280.
thinking of introducing robots but do not understand what they can do.
Together, Open Tech and ORT plan to set up a network of centres where students will be able to find relevant tapes and books, and get a chance to use computers and robots. If you think this could be of interest to you, details can be obtained from Open Tech Programme, Manpower Services Commission, Moorfoot, Sheffield \$1 4PQ. Tel: (0742) 753275.

IF you like to keep abreast of latest developments in the micro industry it is always worthwhile taking a look around some of the computer fairs. Many companies wait for an important show to launch new products, so you never know what you might see. Make a note of these dates:
Midland Computer Fair - 3rd6th April, Bingley Hall, Birmingham.
11th ZX Microfair - 28 th April, Alexandra Palace, London. 5th International Commodore Computer Show - 7th-9th June, Novotel London, Hammersmith. Personal Computer Games Easter Show - 20th-22nd April, Solihull Conference Centre, Solihull, West Midlands.

## Beating theHobbit

IF you've failed to crack the Hobbit adventure game, don't despair help is at hand. Melbourne House, who brought you the original Hobbit game is publishing a book called A Guide to Playing the Hobbit. It is not designed to hand you the answer on a plate; rather to suggest possibilities you may not have spot-

The Guide is divided into three sections. The first deals with the
general strategies and tactics involved in playing the game. Sections two and three give guidance on how to overcome the problems you may encounter. Written by David Elkan, it costs $£ 3.95$ and should be in the shops now.


# NEWS <br> 00000000000000000000000000000000000 <br> COMPUTERS have taken yet <br> another step towards science fiction 

## Computer art for all:



THE Commodore International Arf Challenge is an art-of-the-future competition, not an invitation to sit down and do an oil painting of your beloved micro. Rather, Commodore are hoping to receive some very futuristic bits of computer art. To encourage you to take Commodore and ort into the 21st Century, prizes worth a total of $£ 150,000$ are being offered.

Of course, all entries must be produced on a Commodore 64 or a Vic-20, and can be either a still picture or moving artwork - dynamic graphics, with a maximum cycle time of 60 seconds. All the best entries will form an
exhibition which will be taken around the world. Entrants will be divided into three groups, under 12, 12 to 17, and 18 plus. The subject is up to you, it can be traditional or abstract, and works will be accepted on tape or disc.
Top prize in each of the four main host countries, Britain, Germany, the US and Canada, is a $£ 5,000$ scholarship to the college of $\downarrow$ your choice, anywhere in the world, to study computer graphics. You can get entry forms from local computer shops or direct from Commodore, 675 Ajax Avenue, Slough, Berkshire.

IMPOSSIBLE, you could never $£ 12.95$, so it is within reach of run Spectrum software on a most people's pockets. Watch Commodore. Perhaps you out for it in the shops about couldn't, but now you can - now; Computer Choice will be Phoenix Software has come up taking a closer look at the with a clever little gadget which Emulator later on. For details enables you to play any Spec- contact: Phoenix Software, trum game you choose - on Spangles House, 116 Marsh your Commodore 64. It is called Road, Pinner, Middlesex. Tel: an Emulator, and it'll cost 01-868 3353.
becoming reality; a talking room called Vadas - voice activated domestic appliance system. But Vadas was originally designed with the handicapped in mind.

The person who controls the $\rightarrow$ room wears a microphone through which he or she can tell the room what to do. For instance, if you - wanted the light on you might say "Turn the light on please," and the room would be lit. The room works - on voice recognition and it only - recognises the voice that the computer has been programmed to acknowledge.

The computerised room also has a voice synthesiser system, so it can talk back. Say, you wanted the cur$\rightarrow$ tains shut but were sitting so that you couldn't actually see them, the room will talk in a deep robot-like voice, "The curtains are shutting". The computer has a vocabulary of - 255 words that it recognises, but - this can be enlarged.

Vadas is part of a travelling exhibition called Concerned Technology that has been organised by the Department of Trade and Industry. All the exhibits are computer and electronic based aids for the disabled.


PENGUIN BOOKS has introduced a new range of educational software to help people study for exams. There are six cassettes covering: Julius Caesar, Macbeth, Twelfth Night, Romeo and Juliet, Henry IV and The Merchant of Venice. Although they are only available for the Spectrum, they will soon be available for the BBC and Electron micros.
Each program consists of an extensive database, together with a variety of ways of extracting various themes and characters from the script. So if, for example, you wanted to write an essay about Lady Macbeth and Blood, the computer will point you to the relevant points in the play. Such a program certainly doesn't make a substitute for reading and inwardly digesting the play, but it should help you write more informed essays.

However, at $£ 5.95$ a time these cassettes are good value

## Nick and Dave chips

ENTERPRISE Computers is the new name of the company that makes the Enterprise computer, formerly known as Elan. The name had to be changed after some legal difficulties. That is not the only change to affect the new wonder micro from the London-based computer manufacturers, the price has been hiked up too.
Initially the Enterprise range of computers started with a 64 k model costing $£ 199$, but now the price has changed to £199 plus VAT around $£ 230$. But that is still a fair price for a computer with some remarkable features, including a built-in word-processor and stereo sound.

However, there is one other piece of bad news for all you Enterprise fans waiting for the new machine, the launch date has been put back yet again. This is not an uncommon occurrence in the world of microcomputers, after all the Acorn Electron was over a year late, and still
difficult to find even then. Things won't be much better with the Sinclair QL either

The delay can be attributed to a number of factors, one being the change of name - which means changing all the documentation and the cases. But there is also some more work to be done on the special chips, called "Nick and Dave", by Enterprise boffins, which replace hundreds of conventional computer chips and are therefore extremely complex devices.
First shipments of Enterprise computers will hit the shops in September, and the more powerful 128 k version of the machine will be around some time in December. This might be annoying to those who wanted an Enterprise last Christmas, but if you want to know more about the machine, contact Enterprise and ask for a brochure. Enterprise Computers, 31-37 Hoxton Street, London N1. Telephone 01-739 4282.

## FUN TO LERRN



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A RAM adaptor board is available to enable RAM packs to be fitted inside the keyboard case and the Power Supply Unit can also be fitted i desired.


50 BEEP 0.001,20

## 60 NEXT I

Not only is this program much more easy to understand, but it is easily adapted by even the least experienced programmer. I think your readers might be interested in experimenting with this program by altering the colours in the border commands.
Another program I made up using this idea is:
10 FOR I = 0 TO 150
20 FOR B=0 TO 7
30 BORDER B
40 NEXT B : NEXT I
Readers might like to add sound to this program or do something with it. I found it very useful for game endings and it goes very well with explosion sequences for my own games.
I enjoy your short programs and find them very entertaining. I don't like typing out long listings which take up a lot of time so your programs are very good.
Feffrey Makin, Liverpool

## ORIC update

I BOUGHT an Oric-1 16 K computer, thinking that there were plug-in expansion cartridges available to expand it to 48 K . Try as I can I cannot find any anywhere. I am desperate to get some 48 K games because they are the best. I don't want to send off my computer for expansion for fear of damage or loss in the post. Please could you tell me if there is anywhere that I can purchase one of these cartridges, if not, please, could you tell me if and when they will be available.
R. Smith, Stoke-on-Trent, Staffs

I have a press release dated 7th October 1983 from Oric stating that the 16 K Oric can be upgraded through Oric's service department. However, it now appears that you may be able to upgrade your Oric to the new Atmos specification. We will publish more details about this just as soon as we can.

NOPP

Spectrum 48K
(Author: Tina Billett)

A new and totally original game for the 48 K ZX Spectrum.
The Mopp household is yet again in a turmoil. Mrs. Mopp springs into action attempting to clear the debris which her untidy family have left in their wake. The frantic pace of the clear up takes its toll on Mrs. Mopp who occasionally succumbs to the pressure and resorts to the bottle for a little refreshment, with hilarious results!
The game features 8 directional movement from keyboard or Kempston joystick, increasing difficulty, great graphics, sound effects and high score feature, for just


Welcome to Acorn Park Golf Club, a picturesque course set in the heart of Cambridgeshire. For those straying from the fairways there is plenty of difficult rough, numerous water hazards and crater-like bunkers to make life difficult.
We have a number of vacancies for new members (including ladies, juniors and senior citizens), at the very special price of $£ 7.95$ inc. VAT.
Please do not delay, membership is limited to BBC model " $B$ " users only. Electron owners will be welcome in the very near future.
Superb graphics, excellent sound effects and a truly addictive quality make this a must for anybody hooked on the great and ancient game of golf.
£7.95 inc. VAT

## Quicksilva

## (Spectrum)

THE SNOWMAN is definitely not a game in the kill-o-zap vein. In fact, the very worst thing that can happen to you is that you fall asleep - but this game was lively enough to keep me up well past my bedtime!
also score extra points by collecting various goodies such as Christmas trees, Christmas crackers and presents. Ice lollies give you bonus points and also freeze the flame so you can pass over it.
I found that I had some trouble travelling up and down the "ladders" at first - you have to be in exactly the right place otherwise your little person just marches on the spot. I also had to remember not to speed too quickly along the ledges, because if you fall off the edge you lose a go and drift down


The object of the first part of the game is to collect six pieces of snow to build a snowman. These appear, one by one, in various positions on the "ladder and ledge" type layout. You must pick them up and carry them to a spot marked "drop here", and with each one your snowman takes shape. You have four "goes" to collect all six pieces of snow.
You must avoid the gas flames that persue you because they will melt the snow when you are carrying it. As you move around, your food supply reduces, too. Your food level is shown at the bottom of the screen, and you need to keep an eye on this so you don't run out. You can top yourself up by eating Christmas pud or turkey that appears and disappears in various places on the play area. You can


THE SNOWMAN by Raym Brigs is the sory of how snowman that a little boy builds comes to life one winter's night. The boy invites him into his house and the snowman explores things familiar to us, like the electric light and the television, with fascination. He particularly likes the refrigerator, much as we would like a warming fire.
The snowman, apart from having magic enough to come to life, can also fly, and takes the little boy on an enchanting journey over snowy fields and towns, over dark seas where whales dive, to a land of fir trees and snow. This is where the snowmen and women, and Father Christmas, live.

But the night is passing and the little boy must return home, where he says goodbye to his friend the snowman. When he wakes, he dresses quickly and runs downstairs to the garden, where he left the snowman . . Was it all a dream?

We asked Raymond Briggs, the man behind the Snowman, what gave him the idea for the story. He can't remember exactly, "It was a hundred years ago now!" he says. But he thinks it was from a comic which had a story where snowmen came to life.

Quicksilva approached Raymond Briggs with their idea for a that there are places that you can run to when you are carrying the snow, where the flames cannot reach you; useful places to wait if your pursuers are too close. If you succeed in collecting all the snow, a seasonal tune plays to congratulate you.



In stage two, you have to collect the snowman's scarf, buttons, eyes, nose and smile. But beware of the dreaded green sleep monsters you can stop them sending you back to bed by grabbing an alarm clock that appears and disappears - but you have to be quick! The snowman's tie, glasses, trousers, torch, skateboard (a snowman on a skateboard?) and balloons must be collected in stage three, and you win points when they are dropped into place. Once again, you score if you collect flashing objects and food.
But your troubles are not over yet. Having completed the tricky task of building and dressing the snowman, in stage four you have to collect ice cubes to stop him melting. If you complete stage four you go to the next part of the game which has a different screen layout. I began to think that I should have
gone skating or had a snowball fight, it must be easier than building a snowman!
The Snowman is good fun to play though. It's quite fast with plenty of action to keep you on your toes. I liked the graphics, such as the bed that appears at the bottom of the screen to catch you if you "lose" a go or fall off a ledge. And the snowman himself is excellent. But why not put on your thermal underwear and a woolly hat (not forgetting the rest of your winter-time attire!) and build your very own snowman.

Deborah Goldfinch

## RATING



## SOFTWARE re-

 views throughout Computer Choice are rated out of five, from Brilliant to Dullsville. See rating values on the right.| BRILLIANT | ■■■■■ |
| :---: | :---: |
| EXCITING | $\square$ |



## Virgin Games

ANY GAME that features Frankenstein-like monsters can't be all bad. However, it is the graphic display of the monster that is the best feature in this somewhat disappointing game. When I first loaded it, it looked really good, but after an hour or so of critical testing 1 discovered a number of not very wonderful features. Some of which might even be described as bugs.

The game is similar in a superficial way to Manic Miner, and has nine levels, or screens. Little Pac-Man like monsters follow you around as you try to revive the sleeping monster with the contents of a phial of chemicals. The main bug - or feature, is that you might have appeared to escape the clutches of one of these monsters only for him to appear behind you and kill you.

Thus you die for no apparent reason.

If you stop moving, strange things can happen. Sometimes the monsters sit in a stack above you like planes waiting to enter Heathrow, and then for no apparent reason you die. You can also get run over by a trolley that appears at the top of the screen, without ever seeing it. However, all this aside, Dr Franky is a promising game and although I don't recommend that you purchase this game, I'm sure the author Martin Wheeler will soon come up with a smasheroo. $£ 6.95$.

Bill Bennett


## C-trcade

YOU WOULDN'T know it from the cover, or the name, but the
designer of this game got some of his ideas from my favourite television programme, The Prisoner. You are placed in control of Number Six, who lives not in a village, but in a series of mazes. Number Six is not a number, but a little man with a straw boater and a slight resemblance to Patrick McGoohan.

The bubble trouble comes when the rovers - big bouncing white balls, chase Number Six as he wanders around the maze collecting objects and scoring points. If he makes it off the edge of the screen he reappears the other side of the same screen, until all the objects have been taken, then he can move on to the next of fifty different screens.
here. At the same time you have to collect the Dilithium crystals.

It is therefore an arcade game, and if the graphics are nothing to write home about, it doesn't matter, the action is fast. A table of high scores is displayed, and I am very pleased to see that the game can be played with a joystick - you can even reconfigure the keyboard. All of these features add a degree of professionalism to this game.

I doubt that this game has the kind of lasting appeal that similar games have, but it is fun, especially when there are a number of players. And it is fast. $£ 5.95$.

BB



## Mazecube

clock, which isn't a clock at all, but a calendar counting away the days. However, I found a bug in the program, when the turtle sits in the bottom right corner of the screen, with a beastic above him, everything stops. Nothing worth putting you off a good game. £5.95.

BB

## RATING



## PAL Software

THIS IS the computer equivalent of a book of puzzles, in this case each of the puzzles being a weird three-dimensional maze. The aim of the game is for you to steer a little man around the maze collecting money as you go. The problem is that when he picks up some money, a gate slams shut, so you have to be careful not to get stuck between two closed gates.

Mazecube provides what can only be described as low level excitement. That is not because it is boring, but it provides a different type of enjoyment Mazecube is to Space Invaders what a crossword puzzle is to a football match. The 24 different puzzles should keep you going for a few hours, but watch out because some are harder than others. At f4.99 Mazecube $^{\text {4 }}$ is not bad value, but it left me feeling slightly let down that the puzzle was not hard enough. It would make a very good education program, helping children to understand the concept of three dimensions. £4.99.

BB


## Visions

ONLY TEN years to go, and we will all be running around mazes fighting robots? The
game is an arcade type, cast in the same mould as Manic Miner, and while there are not so many screens as that game, each one is more difficult and has more going on.

The graphics and programming are very impressive, but I found it took hours of playing for me to progress even to the second room. This means that provided you are not the sort of person who gives up easily, 1994 will keep you interested for weeks as you struggle towards the final screen - or level, where you must deactivate a giant computer.
All credit must go to Visions for providing a professional finish to the game. There is a display mode, a practice mode and an instruction session all


## Carnell Software

THE NAME and cover artwork fooled me into thinking that I was in for an exciting game. But the only goose pimples I got from this would-be thriller were of embarrassment, it is awful. For a start it is slow, but this game is little more than a slow version of asteroids spruced up with some clever ideas.

Conceptionally this game is great with baddies like the angel of death, but they move across the screen at a snail's

available as options, which means that you don't have to sit through instructions once you have grasped the game. Although this is a good, well written and packaged game it might be so difficult that you find yourself getting frustrated.
Definitely for the expert games player. 87.00 .

BB
RATING पа口口
pace, and quite frankly I didn't want to wait around to see if it gets better later on. The wizard you control zaps at the various nasties from a circle of chalk in the centre of the screen and the nasties fire back. Oh . . . yawn. $\Varangle 5.95$

BB

## RATING



comes into contact with a Gi-Gant, ought to earn him an Oscar. $£ 7.95$

Steve Forster


## Llamasoft Software

THIS IS a zapping game with a difference - it's truly mind-blowing. In fact, its been keeping me awake worrying about my loss of fast reactions, hand and eye co-ordination, and alien-zapping skill.
The "Hell Gate" in the title is an area on the screen in which Zzyaxian droids suddenly appear. You control four laser cannons firing into the middle of the area bounded by four cannon tracks arranged in a square.
Sounds easy, huh? Okay, but the cannon at the top of the square and the one on the right edge of the square move in the opposite direction to their partner cannons, which you control with the joystick, on the bottom and left edges. Moving the bottom one right means the top cannon moving left, and the left cannon down means the right one up - see?
The droids materialise in the centre of the square and then move at an alarming rate towards the edge of the square, where they then follow the tracks and collide with your cannons.
This means they have to be de-
game's Smart Bombs, enemy Zappers and friendly goats. Goats? Yes, goats! Try it for yourself - I'm off for an aspirin. $£ 7.50$

## RATING EETI

## Atarisoft

CENTIPEDES is an old-fashioned shoot-em-up game set in a garden. You are some kind of cosmic Bill or Ben out to protect little weed from the beasties. Just what is going on can, at times, be as incomprehensible as Bill and Ben's speech, though the game is fundamentally very simple.

You have to blast away at a centipede that is scurrying towards the bottom of the screen. When you hit it, it breaks into smaller centipedes that continue their frantic scurrying. You have some freedom of movement at the bottom of the display, but not a lot, and after a while this area gets a bit busy. Spiders, Scorpions and Fleas all get to join in the fun, and of course the more you shoot, the more points you get.

Unless you are very wealthy, or like me very lazy, and not prepared to wait for CBM64 tapes to load a process that can take as long as 14 minutes, it isn't worth spending

stroyed in the middle, or by mutual fire support from the other cannon.

The graphics are excellent when you can see them - because the speed of attacks is tremendous, and attempting to show you a picture of the screen here would not do the game justice.

Luckily, author Jeff Minter includes some advice on tactics, the
your hard-earned money on Centipedes. Although the game is better than the average CBM64 fare, it doesn't warrant the expense. The game lacks something that the arcade version has, and is not as enjoyable as the Atari version either.
$£ 19.09$

BB
RATING $\square$

## Tine

## Interceptor Micro's

THE CLASSIC arcade game transferred to the small screen with no loss of presentation - it's great.
Jumping Jeff, the fast food chef, has to build four Llamaburgers, complete with lettuce, while being hotly pursued by Mr Hot Dog and Miss Egg. Jeff has to walk over the burger parts, knocking them down to the next level on the ladder and ledge-type display where they eventually all come together in a dish and complete that level of the game.
Jeff is armed with doses of pepper, which is left in the path of the pursuing food to momentarily paralyse them when they get too close.

The ladder and ledge display gets harder to negotiate with each level, and more food appears in pursuit. Milkshakes appear on the screen from time to time and Jeff can get extra pepper if he can get to one.
Extra points are scored for trapping any of the food between layers in the burgers.
The music is the McDonald's theme, and still makes me smile every time I play Burger Time. $£ 7.00$

SF

## RATING

## Papillon Software

THIS IS a chance to beat your CBM64, especially if you are good at Scrabble. My Word, as the title suggests, is a word game for up to four players involving the completion of words against the clock.

There are four levels of play, which decide the letters the word will start with, and time allowed to put in the next letter or complete the word is variable from 99 to five seconds.

Each player, or the CBM64 for solo games, displays a letter in turn on the screen. The next letter has to be added in the alloted time and proper words have to be made. If your opponent can't think of the next letter to complete a word, the challenge is passed back to you to see whether you have been bluffing.

Be warned, the CBM64 is not


Burger Time
above cheating, and I caught mine out a few times when challenging it to complete a word it had started.

Letters chosen during play have differing values, and all the players' scores are displayed on the screen as the game proceeds. The nicest touch of My Word is the inclusion of a dictionary within the game package. £7.00

## RATING חTIT



## Visions

GUSHER is very similar in concept to an old board game called Mine a Million. Maybe Mine a Million is better left alone, because unless you have the boredom threshold of a Zen Buddist, Gusher will send you to sleep.

One problem is that the game progresses at a snail's pace, the high resolution graphics brighten it up at first, but soon become very dull. Another feature is that although it purports to be a strategy game, you have very little control over events. You can make one or two decisions and that is about it. Furthermore, you can do little or nothing to frustrate the other players.

Gusher is for two to four players. Nothing wrong with that, but there is no single player option. A single player option would be useful, if you were allowed to play against the computer. However, because Gusher is so essentially dull, and there is little interaction between participants, a single player option would serve only to show that at the end of the day Gusher is an empty game. $£ 9.95$

BB
RATING


## dk'tronics

DICTATOR gives you the chance of running a Banana Republic and, if you're like me, developing a sense of meglomania. The game (if it is a game - some countries and political regimes spring to mind as you play) requires playing off the country's various factions, while robbing the treasury blind and ensuring your escape when the inevitable revolution occurs.
The factions include the peasants, army, landowners, secret police and guerillas, and their strengths and your popularity with them is judged by buying reports from the secret police.
Your success is measured in months in power, how much money you are able to transfer to your secret Swiss bank account and whether you survive assassination attempts and revolution.
You are asked each month to make a Presidential decision, and advice is available about the likely outcome of such a decision, which will affect your popularity and strength.
There is a monthly budget for running the country, and should you be too greedy or wasteful you can always call on the Americans or Russians for foreign aid.
The game's sound is worth mentioning here, since the US or Rus-
sian national anthem is played while your request is considered.
I let the Russians establish a naval base and then was told "Nuts" by the Americans when asking for a loan! The screen text is excellent, and information is called up by single key strokes.
The game's documentaion is comprehensive, with clear instructons, and advice and hints for successful play. If you fancy ultimate power - this is the one for you. $£ 8.00$

Steve Forster
RATING in mion

## Interceptor Micro's

WHAT a let down! Having taken what seemed an eternity to load, Get Off My Garden turned out to be pretty boring, and what was more annoying - a bit of a con.
Okay, there are 64 screens, but when the only thing that changes is the type of enemy that appears, it is a bit of a hollow claim to suggest the game is something really special.
The game involves watering six plants using a robot called Garf, which can fly or travel along the ground. While watering these plants, various enemies appear and collide with Garf. Each collision robs Garf of energy, his ability to fly and eventually every other function. Off he pops, to be replaced by another Garf till all five are defunct and the game is over. I was so bored I turned him into a Kamikaze robot just to get it over with.

What really bugged me was the incessant messages appearing across the top of the screen. Who cares what a bong is? Especially, when the author then tells you it's a piece of equipment used to damage your brain with drug-type preparations. And by the way, I had no interest whether the author wrote the program with or without the aid of hallucinatory drugs - though I'm inclined to believe he does need professional help. $£ 7.00$

## SF

## RATING



## Detender

## Atarisoft

FIRST OF the Atari games for the Vic, and it comes in cartridge form. It definitely has an Atari "feel" to it. For a start it comes in the biggest box! At your command is a rakish spaceship and your mission is to defend the humanoids by zapping the little green aliens.

These nasty green beings kidnap your humanoids. If you don't rescue them, they will mutate and charge at your spaceship. You have to be fast to keep the aliens at bay. They have "baiters" and "bombers" to get you. Don't shoot the pods or they will explode and release deadly "swarmers". I was feeling really good on "normal" skill level, zapping all those aliens, so I promoted myself to "hard" Everything was speeded up and I was totally annihilated.
It's a great fast fun game, with good sounds. Listen to the humanoids crying for help. I quite

satellite Epsilon orbiting the giant gas planet Meridien. You choose your stock - just watch it loaded into the ship (great graphics!), and you're headed for Psi, the first of six satellites. The Psions come crowding round the ship, but are only interested in your brain patterns. Answer their questions correctly and you can have fuel.


## Trader

like it when the spaceship disintegrates and the blast streaks across the screen. However, on the whole, the graphics are rather average.
Don't let that put you off, try challenging a friend as there is twoplayer scoring. A real Star Trek with teeth. 16 K ram pack needed £19.99. Lance Sucharov

## RATING



## Pixel

REALLY brilliant - absolutely wonderful. Are you ready for a great graphic adventure?
You have your spaceship Pegasus, plus 1,000 credits to buy fuel and food to trade. The base is on the

Now on to Beta. You have to manually steer Pegasus into Beta's orbit. If you miss the orbit you will be sucked into the great planet Meridien. Fortunately a space tug from Beta is on hand to rescue you, but at a hefty price in credits. Here you have to load the second part of the program - it's in three parts.
The Betas drive a hard bargain. On Alpha you must steer your ship onto the satellite, using cursor keys, and avoid an expensive crash. You can refuel on Gamma by gobbling the fuel and making a quick getaway. You're forced to land on Delta, and manoeuvre through the Delta slums. Finally home again to Epsilon to work out your profits. A trip of a lifetime. $£ 14.95$

RATING $\square$

## (Battle at the edge of time)

## Llamasoft Software

WAY, way out this one. Here you are a gun-toting llama! Under joystick control, a sweet little llama trots backwards and forwards at the bottom of the screen. A spider slowly descends on a thread from on high. Press the firing button and a withering fire spouts from your now-not-so-sweet llama's mouth. Hit the spider, splat, and you score
but if you snap his thread, the evil wretch drops to ground and crawls revoltingly towards you. Fortunately your bullets ricochet to ground from a blue horizontal line, the height of which is controlled by the joystick. Lower this and you get a blistering intensity of hits against the crawlers. If the spider touches you (shivers), your world explodes.
Highest score is displayed, but also there are no less than 32 levels of play.
A simple, but great zappy game. Unexpanded Vic. £5.50.

## RATING



## Artic Computing Ltd

USING a joystick or keys, you must slither your snake to eat all the flies and beetles, but beware of the deadly mushrooms!
As you eat you grow longer, but you must try not to tie yourself in knots. After downing all the flies and beetles another lot appear, while you get longer and longer.
It isn't as easy as it looks. The green and yellow snake grew convincingly and although the graphics weren't startling, I found the game really compulsive. Unexpanded Vic. $£ 5.95$

LS
RATING



## NEW RELIASES FOR THE DRAGON 32/64 FROM SALAMANDER SOFTWARE

## TUPTE GRAPHICS

 This program has been designed to provide a method of drawing pictures with your computer which is both fun and educational, and yet simple enough to be enjoyed by the young or inexperienced computer user and the enthusiast alike.Pictures are drawn by telling the "turtie" to move forward and turn so that it traces a picture on your TV screen or 4 colour printer/plotter.

Powerful "repeat" and "word library" facilities allow you to build up new commands as you progress, and you can save your "word library" on cassette tape or floppy disc.

The end result of using a system such as this is an increased knowledge of geometry, and a basic understanding of simple programming, making the program an ideal educational tool for all ages.

- Snappy 32 page manual included.
- Runs from cassette or disc (using either Dragon Data DOS or Premier Microsystems DOS).
- Simple command structure.
- Repeat command sequences can be nested to 32 levels.
- "Word" definitioncan be nested to 30 levels.
- Powerful "word library" handling.
- Save and load library using cassette or disc.
- Dynamic editing of command strings and word library.
- Scaling and stretching commands.
- Will draw pictures on 4 colour 『8800 printer/plotter (TRS-80 GCR115,MCP-40, or compatible plotter). Price
89.95


DS is a powertul database package for the Dragon computer, supporting files stored either on cassette or disc (using the Dragon Data DOS).

DRS has been designed for ease of use and flexibility. You can design your own database, specifying number and type of fields. Powerful full screen editor allows easy design of your own screens.

DRS contains full facilities for adding, maintaining and deleting records. Fields may be added to or deleted from existing files even after records have been added. Search facilities allow for selection of records by any portion or combination of fields.

DRS also has an extremely flexible report generator, allowing for anything from printing of labels to paged reports.

- 22000 characters of data per file.
- 154000 characters of data per disc file.
- Each record may contain a maximum of 480 characters, 26 alphanumeric fields and 10 numeric fields. - Inclusive, exclusive and ranged searches on alphanumeric fields.
- Comparative searches on numeric fields.
- Add, delete and change records.
- User definable screen displays.
- User definable report generator.
- Record formats may be changed at any time.
- Disc files require Dragon Data DOS.

Price ع14.95


17 Norfolk Road, Brighton, BN1 3AA. Telephone: Brighton (0273) 771942.
Look out for these other new releases from Salamander Software.
DRAGON: Wings of War $£ 7.95$ (WW II Adventure). The Cricklewood Incident $£ 7.95$ (Weird \& Wondertul Adventure).
BBC: Eagle 87.95 (Original Arcade Action). Turbo $£ 9.95$ (BASIC Compiler)

Atarisoft
POLE Position for the Atari home computer is the home version of the arcade game with the same name. It is fast and furious, with excellent graphics and sound, and is the nearest you can come to real "seat of your pants" driving on a home computer. I even found myself shutting my eyes and praying to my maker on occasions as I darted between rival cars on a dicey bend somewhere out on that track.

The game starts with a practice lap, you against the clock, and you have to go pretty fast even to qualify. Depending on how well you perform in practice, you get a place on the starting grid for the big race, best at the front and worst at the rear. The lights change, and off you roar into the Atari Grand Prix.


Pole Position
practice in the comfort of your own home, with no aching muscles or tennis balls lost over the fence.
You choose whether to play singles or doubles. The court is a nice green grass one, on a brown background so it shows up well.


## Atari Tennis

My biggest disappointment was not getting a bottle of champagne and a kiss from Miss World when I finished. But it can't be long before these finishing touches are included in action games. One drawback is that the car only has two gears which is unrealistic, but this is my only nag about an otherwise superb game. £29.95.

## Bill Bennett

RATING

## Atari

ANYONE for tennis? If you fancy yourself as a star of Wimbledon, this is definitely for you. You can

The players are also suitably lifelike, with different colour kit so you can see which side of the net you are on - that is as long as you're playing singles. For some unknown reason when you play doubles you get a player of each colour on each side, which is very confusing especially if you're playing yourself. Sometimes a ball will appear to be returned quite a distance before the player would have hit it, a curious visual effect.
Despite a few niggles it's surprisingly addictive. The way the two figures on each side are programmed to operate when you play doubles is quite fascinating. If you like and know the game you should also enjoy the computerised version. Cartridge $£ 24.99$.

Sally Clark

## RATING $\square \square$

## Orc Attack

Thorn EMI
AS ORC games go I suppose this is average. The idea is that you must defend your castle from marauding Orcs by the sword, dropping rocks on them, or scalding them with boiling oil. Sounds OK, but in practice it is actually quite difficult to get yourself to stop at a convenient spot along your ramparts in order to inflict this gruesome fate upon your enemies.
You see, you can only drop rocks and pour oil if you find an open space in the battlements. If you manage to practise long and hard enough to overcome the technical
drawback of not being able to stop where you choose, each round will become increasingly difficult. Should you lose all your lives and allowed wounds (you have a wound count) you will die. If you manage to hang on in there you get an extra life - but only if you can prove your worth and kill the spirits, the Sorcerer or the two dreaded stone warts. Cartridge $£ 29.95$.


## Atari

MS. PACMAN is, of course, a version of the munch played, munch loved game, Pacman. Apart from the name there is actually no difference between this and the original, although Atari claims that Ms. Pacman is a much more vicious version of the game - I'm not sure that that's not a rather damning reflection on the feminine nature.
Anyway, it's good because Pacman is a good game. In this version fruit floats around the maze and if you manage to eat them as well you will score more.
The game is impossible to put down . . . just one more go! Don't say you haven't been warned. Cartridge $£ 29.99$.

RATING $\square \square \square \square \square$


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## (ax en en URI

## Softek

AMAZING, ISN'T it how some scientific misconceptions crop up again and again. We all know they're wrong - there is no sound in space, and, applicable to this program, Stone Age humanity and the dinosaurs didn't co-exist.

It's a bit ungracious to be a palaeontological pedant, though, 'cos UGH! from Softek really is my favourite game this month.
The attractively-named UGH is a little figure, who you have to manoeuvre up a diagonal maze in order to steal pterodactyl eggs from a nest at the top of the hill. In the meantime, the owner of the eggs, understandably enraged, tries to drop rocks on you. If you dodge these, there's a raving Tyrannosaurus with a taste for human flesh about. Watch out for him he's a bit handy, know what I mean?
You do get one spear for selfdefence each time you return to base camp. Every 10,000 points
gets you a new maze to keep the interest up.
I found the diagonal joystick movements needed, a bit hard to adjust to at first, but with a bit of practice I became thoroughly addicted. Excellent. $£ 7.95$

Fin Fahey
RATING $\square \square \square \square$


## Dragon Data

OF THE latest range of Dragon Data arcade games, this is the only one that impressed me at all. I'm particularly peeved at the company's very gross packaging. One cassette and a very slim booklet come in an enormous plastic video case, bigger even than the standard VHS format. It doesn't fit on my shelf, and quite honestly I feel it's mutton dressed as lamb.
Having got that off my chest, I enjoyed Lunar Rover Patrol. You are in command of a moon-buggy

trundling through various terrains. Among the hazards to avoid or destroy are flying saucers, vertical laser, boulders, horizontal laser and pot-holes, jumping over. The joystick control is nice and smooth, and the graphics are a treat - the mountains or buildings in the background slide past in a convincing way. It looks as though there are five frames involving different landscapes and hazards on the way, but I only got as far as number three so you'll have to find out for yourself.
I had to knock a point off the software rating because of the price nearly $£ 11$ - means that the Dragon owner is being asked to pay about twice what a comparable Spectrum program would cost.
Indeed, Dragon Data have priced their entire range a bit high. This is

Bridge - this was due to the dictum that all typical computer programmers must be avid Bridge players
who wants to appear typical! Well, Bridge Master looks like being my Nemesis.
This is not really a Bridge-playing program in the sense that Chess programs play - its more of a programmed tutorial - if you make an error the program gently corrects you. The package comes in two sections - a ROM cartridge, which contains the program proper, and a cassette with details of 100 Bridge hands stored on it. For each hand, you may attempt to make the right bid, and having established that, you play the hand.
As I've said, its impossible to lose a hand, as the computer corrects you, however, for every wrong bid or play, the program docks your

odd as expensive software means fewer machines are sold, which means more expensive software. As the makers, Dragon should surely be trying to force the market in the opposite direction. Ah well, mine is not to reason why! $£ 10.95$

FF

## RATING $\square \square \square$



## Dragon Data

OH NO! I've spent a large part of my life refusing to learn how to play
percentage score, so you can see how well you're doing. I did find after a surprisingly few hands, I had much more insight into the bidding
The cassette - "Making the Contract" - comes with a booklet explaining each hand in detail, and Dragon Data say it's the first of a series. Considering all it has to hold, this is one case where D.D.'s new packaging is justified.
Quibbles - well I'd quite like to have been allowed to play badly, and, well, at nearly 30 crisp oncers, it does strike me as a little overpriced. As a teaching program, though, this package sets very high standards indeed. $£ 29.95$

## FF

## RATING








F-

THE TWO machines featured this month have little in common, except that their prices are similar.

Oric's Atmos is a British micro, in most respects an update of the popular Oric-1, while the Spectravideo is a new American machine. In many ways the two micros reflect two divergent marketing attitudes to home computing, and so a comparison of their features should be revealing, particularly from the point of view of the first time user.

GRAPHICS

| Oric Atmos | $\square \square \square$ |
| :--- | :--- |
| SV-318 | $\square \square \square \square$ |

Both of the micros have high- and low-resolution graphic capabilities. A comparison of resolutions reveals little, as we can see:

|  | Atmos | SV-318 |
| :--- | :---: | :---: |
| Text | $40 \times 27$ | $40 \times 24$ |
| Lo-res | $80 \times 81$ | $64 \times 48$ |
| Hi-res | $240 \times 200$ | $256 \times 192$ |

Very similar, except that the Spectravideo can display a range of sixteen colours on-screen, as against the Atmos' eight.
This pales into insignificance however, when we look at how the graphics are manipulated. The Video chip on the SV-318 allows the use of up to 32 sprites, which are user-defined shapes of eight by eight, or eight by sixteen pixels. Sprite graphics are notoriously fast, and in this case easy to use. They are fast because they are built-in as part of the hardware.
Oric takes a different approach to graphics with the Atmos, allowing you to redesign the character set to build graphics, Greek letters and so on to be displayed. Character graphics can be displayed in any resolution. This approach certainly gives you flexibility in text mode, but since all the graphics manipulation is done by your software, the result is predictably slow. When it comes to fast, colourful highresolution shapes, the SV-318 definitely scores.

The only real distinction in sound capabilities between the Atmos and the SV-318 is that the latter channels the sound through the TV speaker, thus enabling harmonies, dissonance, etc. Better still, you can control the envelope shape of the output, and mix in a quantity of white noise. You therefore have a miniature synthesiser at your fingertips. The sound capabilities of either machine are far superior to, for example, the Spectrum, and in this respect they are comparable to more expensive micros, such as the BBC Model B

## KEYBOARD AND CASING

\section*{| Oric Amos | II |
| :--- | :--- |
| SV.318 | ■ |}

With the Atmos, Oric seems to be atoning for the tackiness of the original Oric-1. I took to the new machine at first sight. Compact, and with an unfussy elegance, it's decked out in a simple two-colour decor - black for the top and the character keys, and red for the rest, including a user-programmable function key. More important, it's got a real keyboard, with good tactile feed-back and a space-bar. It's certainly good enough for wordprocessing applications. For example, I typed this review using the Atmos, and it was a painless process. There is one slight oddity, and that's due to the rearrangement of the keys. On the Oric-1, the leftarrow key was to the right of the Z key - on the Atmos it's on the left. "So what?" you may say! Well unfortunately, I know of at least three pieces of Oric-1 software, which you can use on the Atmos, that use these two keys to move right and left. With the positions reversed, life becomes a bit confusing!

With the SV-318, Spectravideo has gone for a more gimmicky layout, but it has its good points. The case is tasteful enough, in stylish cream and brown, but the keys are rubber, somewhat like the Sinclair Spectrum, although fortunately there is a space-bar. The keyboard had a rather dead feel, I thought, and the key spacing didn't seem quite right. And it has a built-in joystick! Having encountered one of these before, I wasn't impressed. Well I'm happy to say in this case it's a sensible innovation.

The joystick is not really for playing games with, it isn't durable enough, and is mostly for moving the text cursor around the screen. This makes program editing, for example, a delight. You can pull it

out and use the base as a touch-pad too. There are two joystick ports on the side of the machine for games applications. In addition, the SV-318 has a number of text editing keys: delete, insert, cut, etc., and most wonderful, it has five programmable function keys, unusual on a machine of this price. The machine automatically displays the function you have assigned to each key on the bottom of the text

## BASIC

## Oric Armos <br> SV-318

Of course, for the non-machine code programmer, it's not a lot of use having wonderful graphics and/or sound capabilities if you can't manipulate them from Basic. In this area, I think, the Atmos falls down.

Atmos Basic is fundamentally the same as that of the Oric-1. The Oric is a notoriously bug-ridden machine, and the Atmos contains new ROMs which seem to have the problems ironed out. For example, the TAB command now works and the machine doesn't throw glitch characters when printing. In addition, a new comand, PRINT
allows easier screen formatting in text mode.

SV-318 Basic is a partial implementation of the MSX standard, which is to say Microsoft Extended Basic, and as such it contains a number of quite advanced functions. Getting to the important bits first, you can program sound using the MML - Music Macro Language - and graphics using GML - Graphic Macro Language. This is a trifle pretentious, since the two features are simply PLAY and DRAW, also utilised by the lowpriced Dragon 32. In order to play a sequence of musical tones, or plot a shape, you can follow the Basic command with a string containing
short sub-commands. I have to admit, it's quite powerful, and coupled with sprite graphics and three-channel sound, a knock-out! The poor old Atmos, on the other hand, struggles along with some rather elementary line draw commands and a limited CIRCLE command. The SV-318 has this too, but can draw more than circles ellipses, and segments of curves. Atmos sound commands are not so bad, but a little tricky to handle, particularly for the first-time user.

The SV-318 allows you to trap Basic errors, ON ERROR GOSUB
and you can detect sprite collisions ON SPRITE GOSUB . . . It also has a very nice range of system commands: block DELETE, program MERGE, automatic line numbering, all these are built-in. On most micros, you need to buy a programmer's took-kit for this sort of stuff! SV-318 Basic doesn't have the extended loop control DO
WHILE and DO
UNTIL useful for writing good structured Basic, while the Atmos does, but in my mind that is outweighed by the excellent graphic and sound functions.

## THE MANUAL

| Oric Atmos | $\square \square$ |
| :--- | ---: |
| SV-318 | $\square \square$ |

I should say, first off, that Oric has actually supplied a manual this time, and not an insult to the user's intelligence, as with the Oric-1 manual. The Atmos manual certainly looks impressive, in keeping with the elegant appearance of the machine, but once you open the cover, it's a fairly impenetrable document, from a beginner's point of view. The old Oric hand of course, should find it very useful indeed - Oric has supplied addresses of ROM routines, and useful system addresses, and there seems to be many a little gem hidden in

SV-318

For: Neat graphics, good Basic, good sound.

Against: Rubbery keys, expensive, requires special tape recorder.

## Atmos

For: Proper
keyboard, load sound, lots of memory, software looks promising.
Against: No joystick port, Basic could be better.

## Distributors:

SV-318;
Spectravideo Ltd,
165 Garth Road,
Morden,
Surrey SM4 4LM

## Atmos;

Oric Products
International Ltd,
Coworth Park,
London Road,
Ascot,
Berks SL 5 7SE

#   똧 




there. The SV-318 manual is written almost entirely from the beginner's viewpoint. Unfortunately it comes across as simple-minded rather than thorough, which means that experienced programmers will find it infuriating. Many advanced commands are simply not mentioned except on the accompanying format card - the best bit, and there is no proper index. For some reason, the only function explained in any detail is sound generation. Pretty hopeless!

## EXPANSION



When it comes to memory there's no real contest, although the Atmos is marketed as a 48 K machine, which the old Oric-1 was, the initial screen on my review model in-
drive must be purchased instead. The only advantage this has over a normal recorder is that it gets its power supply from the console, hence reducing the number of cables. This, in my opinion does not justify the extra cost, $£ 40$, and is some cause for resentment. In general, the majority of SV-318 peripherals are orientated towards the business user.
Oric Products, on the other hand, reflect the small micro market in this country much more directly. The low cost printer/plotter, the MCP-40, has been out for some time, and considering that you get a $£ 40$ discount voucher on every Atmos purchased, represents value for money at $£ 129.95$. Low-cost 3 inch disc drives are expected soon too. These will each hold 320 K and cost about $£ 220$ each. Perhaps the biggest drawback that the Atmos has is the lack of a standard joystick port, whereas the SV-318 will function with standard Atari joysticks.

## SOFTWARE

\section*{| Oric Atmos | $\square \square$ |
| :--- | ---: |
| SV-318 | $\square$ |}

The Oric-1 has been out some time now, and there is a fair amount of software on the market for it. It must be admitted that in comparison with for example Spectrum Software, the general standard is mediocre. A number of excellent packages exist, such as Melbourne House's Hobbit, and Tansoft's products are showing a lot of promise, both in arcade games - they do a fine implementation of Defender - and system software I'm writing this review using Author, their cassette-based word processor. It seems likely that the Oric/Atmos market will continue to expand.

There may on the other hand be some problems involved in using Oric-1 software with the Atmos. Firstly, if a machine-code program uses a routine in the old ROM, it may not work on the Atmos, secondly the cassette operating system is a little touchy, and some programs may refuse to load. In practice, out of about ten cassettes, I on ly had loading problems with two, and one game got hung up, which is probably due to ROM mismatch.

The SV-318 of course, being new to this country has no established software base. Three specimens of
software came with the machine Cross Force turned out to be a mild ly addictive but uninspiring shoot em-up which came on a ROM cart ridge - good background graphics though! Armoured Assault, a twoperson tank battle scenario was about as much fun as being hit in the face with a wet haddock.
Introduction to Basic, rather than being a wonderful full-graphics programming tutorial, was just a collection of rather simple Basic routines on tape. You'd be better off taking them out of books, and magazines like this one, say I. Not a lot to go on, if representative of the software range. There is, however, a Colecovision Games Adaptor available, which will allow their cartridges to be used with the Spectravideo. But why not buy a Colecovision unit then?
Finally, the SV-318 will run the CP/M operating system. This makes available a very wide range of business and utility software, but is probably of peripheral interest to the British home user

## VALUE FOR MONEY



Atmos is basically the machine that Oric should have been marketing in the first place. It's being pushed primarily as competition for the Acorn Electron. Although, in keeping with the British home computer market and its established software base, it is largely intended for games and educational use; paradoxically, its excellent keyboard and low-cost peripherals suit it for cheapo word-processing and similar mundane tasks. It is also $£ 30$ cheaper than the SV-318, at $£ 170$ as opposed to $£ 199$. In fact, a system comprising Atmos, Oric printer, and a 320 K disc drive, will set you back about $£ 520$. Its big limitation is the Basic, which is not the world's best.

The SV-318, on the other hand, looks less like a business computer, but because of American home market requirements is partly being pushed as one; home computer owners apparently like to think that their machine is "useful" in some way.

Its quasi-MSX Basic is its strongest point vis-a-vis the Atmos, but the main point against it is the limited software range available.

## RATING <br>  VEiY GOOD $\square \square \square$



THE triple test ratings match those in the hardware buyers guide. They vary between a single block, which means that the micro in question is seriously lacking in the department under investigation, to five blocks, which means that in this area the micro is one of the best. DISCOUNT SOFTWARE SUPPLIES 8 PORTLAND ROAD, LONDON W11 4LA. 01-221 1473


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There are three main screens to concentrate on in this game: the control room, the periscope view, and the chart room. The control room is the first display you see: it gives you a pretty comprehensive up-date on hydroplane angle, depth meter, periscope, radar display, echo sounder, Asdic, torpedoes left, speed, rudder angle and heading. All this is pretty well thoughtout: Asdic comes on automatically at depths greater than 10 feet - you hear it pinging - and on the surface, the radar is switched on to replace it. The echo sounder is a kind of flat oscilloscope display which rises as the depth of water below the keel falls.

## "Further realism is added"

Further realism is added by the inclusion of this type of submarine's double motor arrangement. Before the introduction of atomic piles in the American submarine Nautilus and in the British sub Dreadnought, most submarines used, and many still do, one diesel and one electric engine. When running on the surface you can use the diesel engine - this recharges the other engines, which are electric and used only when the vessel is submerged. On your Spectrum, you just press the E key to make the changeover.
To fire the torpedoes - and this is, after all, what we're here for - you press the T key. You can even abort a salvo by pressing A. Torpedoes cannot be fired unless the boat is keeping a steady depth and the rudder is midships - straight, to you.
If any of the Focke-Wulf Condors busy looking for you in the air start to home in, you hear it approach and the klaxon sounds. You have two minutes to get 30 feet of water over your conning tower, or else it is wet feet all round. If you faff around too long in front of the target sub, it also puts a tin fish into you with much the same result. This may give you an inkling of the complexity of
this program: the screen display is colourful and functional, and the documentation which comes with the program is clear and informative - even to the extent of telling you a great deal about the history and design of S-boats.

There is also a dual game option on the same cassette - to play this you need two ZX Spectrums both fitted with Interface 1 and their own TV sets. They need to be linked using the networking lead supplied with Interface 1 as shown in the Interface 1 and Microdrive manual.

The game is pretty cerebral, however. It may not appeal to people only recently weaned from Space Invaders. So try and make sure before you buy it that you're not getting in over your head, literally. In a lighter vein - if we can talk about representations of men locked in mortal conflict against each other and the elements in this way is Sumlock's Destroyer for the unexpanded Vic-20.

This is not a bad little shoot-em-up, considering it is crammed into that little 3 K of onboard memory. There is plenty of action going on here. You control a destroyer which can drop depth charges fore and aft, fire at attacking aircraft, and dodge out of the path of falling bombs and rising submarine missiles. There are a lot of keys to press here, so plenty of co-ordination is called for.

## "A stylish touch"

A stylish touch is the line at the bottom of the screen showing how long you have survived. If you get through an entire screen without drowning, you are awarded a bonus on the basis of aircraft floating about in the oggin as a result of your activities. The graphics are nothing to write home about, but given the limitations of the machine, it's not at all bad.
Sub by J. M. Dora, available from Romik, is another game for instrumentation freaks - you don't get so much as a peek at a periscope. As captain of anti-submarine frigate Anachronous
you are attempting to sink a Soviet Yankee-class submarine. This is actually quite a good way to start a world war - it is almost worth pointing out that there were almost as many collisions between American submarines and Soviet vessels in Russian territorial waters during the 70s as

## "Clandestine submerged visitors"

there have been clandestine submerged visitors to Swedish naval bases just recently. It's six of one and half a dozen of the other, and it is a bit cavalier to bring out program scenarios like this which play on uninformed prejudices. Having got this off my chest, the game does not really compare with Hunter Killer for complexity or accuracy.

The screen display has a large central circle, looking suspiciously like a sonar scope, but in fact showing your heading, and in the top left-hand corner, a square showing his heading. Other onscreen readouts indicate what quadrant the sub is in and at what depth, the depth your depthcharges are set to explode at, and your speed. The heading is also shown, likewise range and depthcharges left. If you knew what speed the sub was travelling at, the whole operation might be a bit less hit and miss. As it was, I was on top of the sub several times blasting away like a scene from Ice Station Zebra or the Bedford Incident but he never blew up. Which is probably just as well for world peace.




The Turk

Most people have tried their hand at the time-honoured game of chess, and it's a great thrill to finally checkmate your luckless opponent. Today, there are many computer games on the market, so you can have your own ready-made opponent on most types of computer.

THE TROUBLE with most computer chess games is that they tend to be very smart, even at basic levels, so you won't catch them making many mistakes. On the other hand, they can be very forgiving of your mistakes - you can often take back moves - cheat. On a lighter note, their big advantage for me is that when you get the upper hand, you can't see those satisfying signs of nervous behaviour, such as glowering, nail biting, fits of depression, or even attempts to pull out the plug - the equivalent of kicking over the chess table. Maybe after last month's feature on speech synthesisers, chess programs could be humanised to say "oh no", "I didn't think of that", "you are clever", or even 'II hate to do this after such a good game, but checkmate".


All the chess programs have several levels of play usually between five and ten. The easiest levels will often give an immediate response by the computer, while at the highest levels, the computer will take several hours to make a move - a sort of masochism chess. I chose a level of play on each chess program that was nearest to ten seconds response time. This was obtained from the manufacturer's literature or if unavailable from my own calculations.

Except for one program this was always one or two levels above the lowest.
I should say that the championship results don't indicate that one game is better than another. All of them are competent players, and if you want a higher standard, you can always play at a higher level, but pay the penalty of a longer game. If you do want to compare games, the choice will mostly centre round the various special options, and I will describe much of these as we go along. I was able to get seven games in time for this chess championship, four for the Spectrum, and one each for the Vic-20, the Atari 400 and the Electron.
The plan was to play every chess program against every other one. This playout took 21 games, plus an extra one when one game was aborted. Each game took about an hour (with a fair amount of time in setting up and keeping everything running sweetly!). After that, the programs had all their wins totted up and the two highest became the champions. They had a final game at a higher level to find the champion of champions!

## The championship

## Psion Chess

First program was Psion Chess for the Spectrum which was played against the Atari Chess. Psion quickly gained the upper hand, kept up its attack from the start and won. Not terribly exciting, but a good clean fight. Psion's instructions did not give any idea of the time for each of its nine levels of play. I timed it to level 3. However, as the game progressed it was taking anything up to a minute to play. What was nice about the Psion unlike the other Spectrum games, was that every time a key was pressed, a tinkling sound was made, so you knew the input was registered. It also listed on the screen the last fourteen moves of each player, and the total number of moves made.


Psion won three of its six matches and performed very well against others. Further options you could summon up in this program were advice from the computer on your move, and saving programs to printer and tape.

## Atari Chess

The Atari not only came second best against Psion, but also against every other of the chess programs. Bottom of the league I'm afraid. From its literature this was the only one that was on its lowest level of play. The next level up, however, did overextend its play time. It did make some daft moves now and then. As to the screen display, it had the largest chess board of the lot - good for myopics - but then again it told you nothing else, other than the level of play. Everything had to be entered by joystick which couldn't induce the cursor to move faster than a snail's pace across the board. One thing I did like which was unique to Atari, was, having moved a piece it left the cursor in the piece's former position. This helped in picking up a game that had been left off. You could summon an option to set up a game. With a 1979 copyright, it was the joint oldest game with Sargon.

## Superchess III

Superchess III for the Spectrum, by C. P. Software was one of the two champions of the first round, and had a stiff fight from Psion. The match started cautiously on both sides, each building up a pyramid of forces on their own side of the board, and castling modestly. By the 16 th move neither had crossed the middle line, with Psion taking noticeably longer to play. Then Psion attacked. A real struggle followed and Superchess looked as if it might lose. But Psion lost a rook and Superchess took advantage to make an elegant checkmate. Classy.

Superchess III (or 3.0 as it says on the box) is the newest program, with a copyright of 1st December 1983. I had to time this one like Psion, and chose level 1. Level 0 seemed immediate. This game had the most intriguing goodies on the screen. The best was the "score". This gave a special assessment of the program's board position. Points are given for taking pieces e.g. 16 for a pawn, 144 for a queen, but also for pinning pieces down, and for pieces with good control and mobility on the board. Penalties are for obstructed positions. There is also a "nodes" number, which is the number of positions considered before play. Options that can be summoned up are forcing the computer to move if you can't wait, advice on your move, play itself, change sides, set up a game and others.
Superchess had another cautious game, this time with Cyrus. The former slowly moved into attack and after some elegant play, Superchess won. In the match against the Turk, the latter quickly moved into the attack. Then slowly, Superchess went into the attack and made another fine checkmate with very few pieces taken.

## Cyrus Chess

Cyrus Chess for the Spectrum by Intelligent Software, was the 1981 European Champion. Unlike the other Spectrum games, you don't input co-ordinates of a move, but use the cursor keys. They make a pleasant little trimphone sound in use. Oddly the co-ordinates are not displayed round the board, but it does beep when it moves. You can also force a move, change sides, replay all the moves of a

## Chess Tutor

If you are a complete beginner, and can't even tell a rook from a knight, then this is the program for you. Those with a rudimentary grasp of the game may find the technical terms for moves interesting, but otherwise will find the exercises on how to move a pawn very tedious.

Chess Tutor starts by explaining the board, giving you exercises to ensure you understand - it does this throughout. Then it tells you where all the pieces go, followed by detailed instruction on each
piece. The next part deals with check, checkmate, stalemate and castling. The final part sounds very complicated, forks, double attacks and skewers, but they are just technical terms for what will become every day moves.
Although Chess Tutor ensures you have grasped the basic rules, and tests you constantly along the way, you won't get a chance to play a game. This is a pity because perhaps the regular chess games available will be a little too difficult at first.
game, and set up a game for study. There is also a printer facility, and saving a game to tape. The feature I liked best was to take back a move. I did sometimes key in a move wrongly which was played. Here it could be simply taken back, while with other programs you would have to go through a lengthy set-up routine. Cyrus was the only one to display the pieces taken, which unfortunately were almost too small to see.

## Electron Chess

Electron Chess for the Acorn Electron, by Program Power, did manage to beat the Atari conclusively, and after a long drawnout contest, the Turk program as well. These were the only two it beat, and was unexcitingly put down by the other programs. The board was large and clear on the screen, and I liked the two clocks showing cumulative time taken by each player to move. The clocks did reveal that the Electron, like the Atari, was often taking less time on their moves. The only other thing the screen showed was last move coordinates. You could summon up options to set up a game, save to tape and blitz chess. Here you are allowed 10 to 30 seconds to move or you lose your go.

## The Turk

The Turk for the Spectrum, by Oxford Computer Publishing, performed very well and deserved a higher score than winning just two of its six games. It beat Cyrus in an exciting game with both sides attacking strongly. The Turk was on its level 2 and had a long slog against Sargon. The latter won, although it took rather longer in its moves. An oddity with the Turk is that the white pieces are coloured brown. But it did mean they were difficult to distinguish from the black pieces particularly if the Spectrum got tired and threw wavy lines everywhere. Like Electron it could do blitz chess, load to tape and printer, do game setups, replay all the moves, and even play with itself?

## Sargon II

Sargon II by the Commodore Home Computer Division, for the Vic-20 turned out to be one of the champions for the first stage. It also was joint oldest with the Atari, with a 1979 copyright. Unfortunately I found the board difficult to read. It was stretched widthways, and used only the colours blue
initiative only just with Sargon. Superchess's intriguing "score" kept ebbing lower. Superchess did press attacks, but Sargon kept up the pressure and finally won. Thus Sargon II was the overall winner of the first round, with no losses!

## Champion of champions

For this final match, Sargon II was playing black on level 2. Superchess III was playing white at level 3, which gave just about the same playing time of about a minute. Superchess opened with a knight and there followed a pawn exchange. All the while Superchess's personal 'score"' sank slowly and it seemed there was going to be a re-run of the last game. Queens were exchanged, knights and bishops were exchanged and the "score" dropped to -21 . Then Superchess sacrificed a knight to bring Sargon's king out into the open. The "score"s started to rise and reached a high of +38 . But it fell back to +3 as a pawn battle developed. Superchess then got in several checks and managed to separate Sargon's king from its other pieces. The "score"' climbed to +48 . Superchess then battled a pawn forward to get a queen and the "score" leap to +159 . The queen eliminated Sargon's rook and knight and managed to get the last pawn home for a second queen! The "score" rocketted to $+32,763$ and Sargon II was quickly checkmated.

So, it was hard luck Sargon, but a very sporting fight. And to Superchess III went my highest accolade of Champion of Champions!

## Championship table



by Sally Clark


JIM Whiting's claim to fame is his robots.
These are not ordinary
Dalek-type robots - for a start they are manipulated by a Spectrum They wear suits, some even talk, and all their movements are caused by compressed air.

Jim Whiting was spotted by Godley and Creme, ex-10cc members, who used some of his characters to make a video for Herbie Hancock's single, "Rockit". You may have been lucky enough to see it, some time in January.
The robots have evolved slowly. Jim started an Art school course, but left because he didn't think it was the right place to be. He went through a series of different jobs; one was as a technician at the Architectural Association. While he was there he used their workshops as a studio, "I had all my junk in there, all these bodies and things." The Bath Festival was his first opportunity to put on a show, "I made a ghost train for the kids there. I was very unpopular because the whole thing was run from a 2 CV car, and it was an alternative technology festival. The exhaust of the car was blasting into the Friends of the Earth tent. A little pedal car with a boy in it went up a hill and backed into a sack of muesli and burst it."
Despite this he was asked back two years later. "I did a show in a graveyard with all these jumping suits. There were 16 suits on a cable, like a ski-lift, which I still use." Jim did lots of small shows with these jumping suits, until finally he was asked to do a big show at the Hayward Gallery, the Hayward Annual in 1979. He staged an enormous piece with about 30 businessmen - robots, not real. But the men weren't just sitting at desks, "one got kicked in the head by another man; two had wind coming out of their trousers and flew around like jets. About 20 feet up on a ski-lift, some robot men were chasing a secretary, and jackets and trousers were being winched up and down. I had no idea how to control it so I ended up at a desk about 15 feet up, pressing a button three times a day." At this stage he didn't have a computer to synchronise his robots.

## Roof top robots

The next big show was on the roof of the National Theatre in 1981. This time Jim's robots were all programmed, not by computer, but by central heating timers and things like that. "All these bodies stood up in the middle of the night, and moved around until the early hours then collapsed before sunrise. So it was a night-time show with lots of light, and nothing left in the day." After this he went back to doing a smaller show, costs are high and he'd made a loss doing the roof show despite efforts to find sponsors. "I grouped together these machines I call the unnatural bodies, the ones that were in the Herbie Hancock video, and I made a show called Purgatory, which is an area of judgement between heaven and hell."
The show was taken to Wales, North England and London. "It was erected on a big mast with flying nymphs on it and stuff like that. After I'd done that for a while I wanted to do a night-club piece, because I really like exhibiting out of the gallery context in a public space. I like the audience to be uninitiated, not necessarily a gallery viewing public. So I thought I'd have a stab at the night-clubs. I woke up one morning and suddenly decided to build the Pervy Men or three pairs of trousers personified. I wanted them to be human to such an extent that they would be quite endearing. I built them in about 10 days."
The first place Jim took the Pervy Men was the Edinburgh Festival. At this venue he had two big contracts for quite a lot of money, both of which were stopped and he had to fight to get some of the money back he had already spent. "One of them was called Sid the Ticket Collector, and he
took tickets from one of the opera buildings down to the disused opera site. I built this ticket collector chap on a big cable, he had his own tape recorder and I made a computer for him, but they said they didn't want him. So I came all the way down to London and picked up the Perves, took them up and made a slot-machine in a restaurant. They went down really well, you put 50 pence in and were able to control the men, while a record played; it was all automatic. People almost did it competitively, you could do so many different movements with them. On one of the first days I had them going I was playing around with them, and Adam, one of the Pervy Men, kicked this man in the head. He was the director who wouldn't pay me, it's funny that a couple of days after that he paid up." Jim doesn't usually name his characters, but this one was named after his girlfriend's father, the other two men are the fat man and the tall man. "The fat man moves like a fat man, the tall one's very lanky, little Adam's very fast."
People would give Sid the Ticket Collector money and off he'd go, and come back with their tickets, only sometimes he just didn't come back. "He had this whole rhetoric; 'would you like a ticket sir', you put your money into his hand and he shot off and would come back with the ticket, 'Here's your ticket sir', and things like that. He'd always say something different. He said his thank you once, and shot off with his money in his hand, and it was so funny because the man was already five minutes late and wanted his ticket quickly. He got stuck, he just wouldn't move, I don't know why, he always moved except this time. He was swinging up in the air with this fiver clenched in his little fist." Unfortunately, Jim only had Sid going for the last three days of the Festival because of all the trouble.
Jim then took the Pervy Men around several clubs; the Camden Palais, the Embassy and other London night clubs. It was when David Gail, whom he had met at the Bath Festival, mentioned
him to the Channel 4 production team that he got the chance to appear on our screens. "They let me do my own little five minute film of the Pervy Men getting out of bed, having breakfast and going to the club. Godley and Creme saw it and next thing is they asked me to bring all my robots to their studio. So we made the Godley and Creme video for Herbie Hancock." The video was made in a day. "Godley and Creme worked very hard. They work together like one person, I've never seen two people work like that; totally unselfishly.'

## On tour with Herbie

Herbie Hancock was impressed enough to take the robots on tour with him. "He took the Pervy Men, that's why they've all been dry-cleaned, and had their shoes polished. He took them and this lady." 'This lady' is just a pair of legs with red stilletoes. "He took one or two other men and a baby and they went down great guns." When I visited Jim, he was getting his robots ready to go to Los Angeles, for the presentation of a Grammy award to Herbie Hancock for the Rockit single. He's hoping that a lot of work will come his way as a result of this.
"Going concurrently I've got this show called Judgement. It was on from mid-November until early January in Sheffield, people came from a hundred mile radius to see this show, but I can't find a London venue. The Judgement show is a bit like a Heironymus Bosch painting. I have the Garden of Earthly Delights, there are two drunken barmen, a huge blue machine full of acrobats and a business machine with all these blokes on it, and upstairs, purgatory."
Jim Whiting has always built things. "I bought an enormous Mechano set from another boy for two weeks pocket money when I was at school. I'd buy whole sets of Mechano, so I was never short of it. I made fantastic toys while I was at


school. I built a robot cricketer and a motor-cycle jump thing, that could have been quite commercial had it been sold.
He read Systems Control and Electronics at St Mary College, London, but insists that this hasn't helped him with his robots at all. Except for once, when he was planning the show on top of the National Theatre. "I had to write a proper report, I had to do lots of equations to work out safety calculations, there are very strong winds up there because of the Thames Estuary. I went up to the Met Office and got their figures and then I had to work out exactly how much each man would bend in different winds. I had to make a dossier for three engineers, some council person, a couple of architects, none of them could do any maths at all, but they demanded it. They passed it, but they couldn't understand it."
Jim only started using a computer to manipulate his robots after his Pervy Men had caught fire. The Perves had a computer made out of telephone equipment uniselectors, a mercury switch and all sorts of timers. "The BBC came round once and wanted to film them and it just burst into flames. I rang Sinclair Research that afternoon and was sent a ZX-81. I wasn't too happy with it, I think I messed it up a bit because I tried to make an automatic loading machine - a tape recorder that would load a program, run it back and try it again. Something went wrong when I knocked something inside. As soon as the Spectrum was ready, Sinclair let me have the only one. I started using that and it is so much better, I can't fault it. I've written all sorts of different programs for these robots.
"It is difficult switching 20 things on and off as a composition unless you have a computer. The Pervy Men have 15 control lines between three of them, and combinations of lines make different movements. Timing is essential if you want to get a certain whippy movement, with different timing you get completely different movements. The computer is essential to make them do certain funny or in-depth patterns of movement. Whereas the other models are just turned off and on." Jim uses 24 control lines from his Spectrum, he could have up to 96 . These 24 lines are directed to different machines, so that they can be made to work consecutively. This means as the
one cable with six wires in it and one air-supply, and that will do six different movements. Some of the cables I've got have 24 wires in them, so I can do all 24 movements at once."

## Dangerous men!

Before Jim acquired his computers, keeping his robots moving could be rather dangerous. The Business Men at the Hayward Gallery ran off mains electricity: "bits kept flying off it, and it blew up a couple of times". He's obviously glad to see the back of all that. "To make these valves go you can use quite low voltage supplies, 24 volts. Whereas to make motors do the same thing as the air I had to have mains current, so if there was a short circuit or a motor burnt out there was a fire and smoke. That was all a bit mad. I knew nothing about compressed air then, now that it's come it has made everything so much easier. The machines that are still mains powered are much safer because I've got plugs and sockets on them all. The ones in the video were all mains machines, apart from the Pervy Men. They've been so tried and tested now, they run really well."
Jim has plans for a computer game with a difference. "I'm going to make a big computer game for real, instead of it being on the screen the audience will actually be able to walk into it and be part of the game. They won't be given guns, it'll be the type of game where you might get locked up in a little room or you'll get directed on to a short circuit and out of a door. You'll be out really quickly wondering why, then you have another go.

Real people are used to cast moulds for Jim's figures. As long as you don't suffer from claustrophobia you'd be OK. He literally pours plaster all over someone, leaves them for seven minutes to let it set, before letting them go free. "I had to do the first one, and I was stuck in there for one hour 20 minutes because they mixed the plaster wrong. I couldn't let on that it was highly uncomfortable, it was unmanageable in there hotter then the hottest bath I've ever had." He leaves channels for the air to reach the nose, so his victims can breath. But the robots aren't all made of plaster these days; Jim would like to make some out of steel, but this is expensive. Most are
made from foam and latex rubber. Sometimes he uses bits of shop dummies and modifies them by putting on new knees. "I cast the knees of a girl and made them bent. You can't get bent dummy legs, the knees look very nobbly compared to the rest of the leg.'
The ideas for Jim's characters come from two sources it seems, childhood dreams and sheer inspiration. "A lot of the old machines are dream inspired. There were dreams I had when I was four or five years old, I've tried to encapsulate the emotions of the dreams in a real show. I tried to make them come clearer in these machines, I haven't taken real images out of these dreams, in the most part it's emotions that I've tried to conjure up." The way the Pervy Men came into being - wake up and create it - is rare. "I need to go through this sort of thing, to suddenly wake up and want to do something completely new and not bother about the old things. At the time I built the Pervy Men, I'd been building all these motorised machines, it was the first compressed air thing I built."
The rough and tumble that the robots have to go through means they get rather tatty quite quickly. "The Herbie Hancock team really liked the scruffiness. It embarasses me no end, but in order to make stuff you have to work so fast. We might knock out five heads in a day." Jim learnt to program due to necessity. He'd never used a computer before the day he rang Sinclair and has no time to play games and things like other micro owners. "I don't find it difficult, but it takes a long time. You know how they say programming can keep you awake all night, it can without you knowing it, sometimes I realise it's six o'clock in the morning and I just don't feel tired at all. Whereas I do get quite tired making stuff and quite often I work into the night to meet a deadline. Maybe I've written a program and after a week I find I've approached it the wrong way and I've had to completely rewrite it, and I've never regretted having wasted that time. For some reason I don't get bad tempered programming, but I do making things."




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[^2]
# The pupils at Dysart School are handicapped but a visit to the school proves that the appeal of computers to kids is universal. 

THE BBC Microcomputer has been introduced into schools all over the country. Soon all students should be leaving school with a degree of computer literacy, but is it that simple? All sorts of new problems have emerged, things like allocation of hardware - how do you ensure everyone gets a turn on the computer when there's one micro between 400? Finding suitable programs is not easy, and teachers with no computer experience at all are expected to learn and teach simultaneously.
I visited Dysart School in Kingston-uponThames, it is not an ordinary school in that it caters for $\operatorname{ESN}(S)$ children - Severely Educationally Subnormal. Obviously the teachers here have special problems as the children are all mentally handicapped, and some are physically handicapped as well. But they recently acquired a BBC Micro, and the fascination it holds for the pupils is at once apparent. The first class I visited
was the infants, the school looks after 2 to 19 year olds. Bob Wall, one of the teachers, has written a program called The Face, which has proved very popular with the young ones.
The Face is a simple program, all the children have to do is touch the keys and a face is built up on the screen. On completion of the picture they are rewarded with a tune. For children who are severely physically handicapped its a great effort to even touch the keyboard. More able children can combine the face with colour recognition.
At the moment the children and staff are just learning how to use the BBC Micro, but just seeing things on a TV screen holds a lot of the children's attention. The computer at this stage is not teaching anything the traditional tutor cannot. It is good as far as the severely handicapped children are concerned because it encourages them to relate to their environment. The children enjoy it and it helps hold their

concentration, but the view seems to be that if they didn't have it, teaching methods would not suffer. However, this is the age of the computer and as the children grow up they will encounter them more and more, so it is good that they become familiar with micros at an early age.
Even though the school has not had its BBC Micro for long, there are some add-ons that they will need in the near future, a touchpad and disc drive. A touch pad would help those that are too physically handicapped to cope with the keys,

## "Some of them will use it for hours on end"

and a disc drive is necessary as the loading time of cassettes is too long. You or I might not think much of waiting two to five minutes for a program to load but in a class like this it is very disruptive.
The other age group I observed was the 16 to 19 year olds. These teenagers mainly use the BBC Micro for number work and reinforcing what has already been learnt. Some of them will use it for hours on end if given the chance. Here again, it has been noticed that the fascination for computers can lengthen the amount of time that the child can concentrate. In the special care class there are children with very small attention spans, normal children will be able to concentrate for perhaps 40 minutes, obviously anything that can help increase this is welcome. If the students are playing with simple games, most of them at this stage can be left on their own. But with anything more complicated they need supervision.
Unfortunately, at the moment there are very few programs around which are suitable for these children. It is a pity as some of the older children are very motivated by it. When they are 19 years old they must leave school, and the centre which will care for them as adults also has micros. In perhaps 10 or 15 years time they may come across situations in which they are required to use computers. So, what the school is teaching them now is also preparing them for life outside school. A few of them might go out to work, but today when ordinary students cannot find work what chance do the ESN(S) students stand?
One of the most popular programs involves guessing which letters make a word. Before the
child can use it he or she must have a fair idea of phonetics, and word structures, so that if the second letter in a word is P , then he will have a fair idea that the first letter will probably be S, and that the majority of words don't end in A. To a large extent the pupil may be guessing and if the program contains only 30 words they are capable of learning them after a while. The game itself is like space hangman, where you have so many goes to get the word. If you run out of turns you get blown up; if you are successful it plays a triumphant tune. The look of delight on the face of the boy playing the game shows how much pleasure it gives.

## "The centre will be a sort of software pool"

There is a computer centre at Kingston Hill which services the area. This centre has access to a number of schools and parents who write software. Various local authorities are now writing software which isn't copyrighted.
The centre will act as a software pool. It is harder for this school to find suitable software because its needs are so different. The 16 and 17 year olds that are taught at Dysart School are at primary level mentally, but need programs with images suited to teenagers. Because there are so few ESN(S) schools, professional software houses are not going to be interested in producing software relevant to their needs. It is down to parents and teachers to provide suitable programs.
Special schools have smaller classes, there are 13 pupils and two staff in this particular class. This means that they have less problems ensuring that each child has a reasonable amount of access to the machine. In ordinary schools, even working in small groups, the children cannot get enough time with a micro. Imagine a typical primary school of 400 children with one computer, each class has at least 30 pupils and use of the computer for, say, a morning a week. This would mean that each child would only have a couple of minutes on the machine so it is imperative to work in small groups.
It is also difficult to find games which are simple enough for handicapped kids to play. Up and down keys are far too technical to grasp, so a press-one-key type program is required, unfortunately even these children soon learn that they just lean on the key continuously and the target will be bombed regardless. What they really need is some sort of adaptation for the keyboard, there are various ones on the market already although some are massively overpriced. There is also the danger of buying one of these adaptations and then finding there is no software for it.

## "All they have to do is press any key"

To cater for the severely handicapped pupils at his school, Bob has linked up the keyboard so that all they have to do is press any key to get a result. If you consider how little these children can achieve on their own, some of them cannot even speak, it is obvious how important a micro is to them. The extra money for these very necessary add-ons will have to be raised by PTAs or by donations. People like the Toys Aid Foundation are marketing special equipment.

In an attempt to ensure that schools only buy good quality software, Kingston Borough has set


This group is looking at software; an educational pack may cost $£ 30-£ 40$, which is a lot of money to waste if it's no use. It is likely that most authorities will set up these workshops, enabling teachers from different schools to get together, and share the mammoth task of reviewing the available software. This is a fairly effective way of ensuring some 400 programs at the borough's centre are reviewed.

## "Help from parents will be solicited"

The Government is also taking precautions to ensure that teachers are prepared for the new technology. Before a school is given a computer two teachers have to go on a training course. Then the school can have its computer, and there are subsequent courses the teachers can go on, to help them understand things like graphics, or turtles. It is also likely that help from parents will be solicited; these days with so many people in the computer industry it is very likely that some

whom the schools have access, but the people/time ratio rears its head again, and the Secondary schools will take precedence, if only because their systems were set up first.
In the future perhaps, voice recognition hardware will be introduced into special schools, which would avoid key recognition or the inability to use limbs in co-ordination. But the main problems are those of management. How does the teacher set up the computer in the classroom to the best advantage? How can they ensure each child gets sufficient time with it? What do you do if a teacher doesn't want to use them in the class? Some teachers are still scared of them or sceptical about the value of computers in the classroom. Will the rest of the class get on with their work while the lucky one or two are using it?

Below: Clive


# TIHE ADVENTURE PAGE! 

book (there must be some who haven't!') some of the fun will be lost on you. So read, schmuck!

As I say, Quibbles - Salamander supply their usual elaborate documentation, full of visual clues and the program although not huge by some Adventure Game standards, is full of enough red herrings and blue kippers to keep you up late for a week.

Watch out for the Pan-Galactic Gargle Blasters, and above all DON'T PANIC!

Fin Fahey

## Salamander Software (Dragon, Oric)

THE second episode of Salamander Software's Dan Diamond trilogy, Lost In Space, has arrived. The preceding program, Franklin's Tomb, to my mind, broke through conventional Adventure Game conventions by being funny (remember humour?). Lost In Space rockets (geddit?) along in the same vein.
L.I.S. ends where Franklin's Tomb left off - our intrepid private eye (who is incidentally now portrayed on the packaging as a Harrison Ford clone rather than Bogart) finds himself on a deserted starship. Security robots rush in and . . . well, you'll have to find out for yourself. Me, I loved it.
Quibbles? - Well I didn't much care for the grandiose VHS cassette sized packaging - it doesn't sit well on my shelf with the standard-sized library boxes. And . . . perhaps the humour this time was a little secondhand, relying largely on a certain "Hitch-hiker's Guide to the Galaxy" for its in-joke references. If you haven't read this venerable

## RATING ■II日



Level 9 Computing
(48K Spectrum)
ADVENTURE GAME fans will love it, another adventure from Level 9. Having played the game for a few hours, I didn't get very far and seemed to find dead ends in every direction. However, Level 9 advise that this adventure could take weeks, even months, to master and they do include a hints card for obtaining a clue (or clues if you're lucky). The adventure has well over 200 locations in which you have to solve a large number of puzzles in
order to collect the objects needed to defeat the Evil Time Lords.
The programme even has a sense of humour take a look in the looking-glass in the Country Cottage and the reply is: "Cor! You look prettier every day." There is also a saying "Arfle Barfle gloop," which I could only construe as, what a load of rubbish!

Andrew Rhodes

## RATING

up energy and bribery uses up Gold.
The commands, of which there are only fourteen including the directions, are entered as single letters so your choice of actions is rather limited. The screen is divided into three when you are playing, the top segment briefly describes where you are and what particular "nasty" you are faced with while the bottom two contain a sparse but colourful location graphic and a state of play counter when you are fighting, there is also a map facility which you can call-up to show you the location of the Golden Palace.
If you can ignore the awful pink colour of the cassette sleeve and the condescending tone of the instructions then the game could provide an easy introduction to adventures, particularly for the much younger player, either male or female.

## Cases Computer

Simulations Ltd (Spectrum)
DIAMOND QUEST is one of a new series of games for girls from Cases Computer Simulations Ltd, other titles include Jungle Adventure and Hickstead. The idea of the game is to wander about a land, find four keys and take them to the Golden Palace where the diamond treasure is to be found. While you are venturing around the land you come up against what are quaintly called "nasties", which range from Tigers to Fleas and blood-thirsty Bats. The "nasties" don't turn out to be too mean, however, because apart from attacking them heaven forbid - you can either bribe the monster to go away or simply run, an attack or retreat uses

## Chris Rogers

## RATING $\square \square$



## Program Power (Electron)

ELECTRON ADVENTURE is a text-only game. The object is to rescue the princess from the Magic Caverns, sounds easy but not so in reality. In the true tradition of adventure games, the use of lateral thinking can help you on the way at

times. It took me almost an hour before I found how to get into the main part of the adventure; at one point I was frustrated almost to the point of gnawing my way through the cassette lead.
This adventure can at times be almost rude, so I felt compelled to answer it back in a similar way (naughty words), which resulted in the game ending. I think, in general, that adventure games are under-rated; they are often more interesting than the average shoot-em-up game. A good adventure, as this one is, should be an on-going situation as the player moves on unearthing new avenues in his/her effort to complete the task. I am not going to say too much about the adventure because it would spoil it for anyone buying the program, but I recommend it.


Phoenix Software Ltd (Vic-20)
NOW HERE is a game with a difference. Someone has stolen the " 0 " level papers and replaced them with impossible-to-do fakes. You have to get the real ones back. There are actually two cassettes to this game. The first one is an action game where you jump over a series of walls collecting little blue books while avoiding balls thrown by evil teachers. When you have collected all the books, you go up a skill level where everything moves faster. At levels $1,8,9$ and 10 you are given a
clue to solve the adventure in the second cassette.

By the time I reached skill level 4 I began to crack up - I just couldn't get any farther. I did the only thing I could - I switched the beast off.

However, armed with one clue I set out on the adventure game. The object was to find the original "O" level papers and substitute them for the fakes. Clue one was a help, but I still couldn't find the papers Maybe my brain wasn't up to "O' levels anyway. The adventure part, which just displayed text, took you to a lawn, reception room, w.c., sewer and other places.

The idea of the game is original, but taken as a whole, I found the game average. 8 K ram needed.

Lance Sucharov

## RATING



Quicksilva (CBM 64)
RING of Power is a standard adventure game, and while it's acceptable, I found it slightly annoying. The sparse scene setting left me wondering what character I was portraying and what I had to do. Find treasure, I know, but there was something lacking.

More annoying was the documentation's claim that the game had a graphics or text option. If that meant a symbol, like a lamp or key, appearing in the top right hand of the screen, where was the option? Perhaps it wasn't treasure I was searching for, but a way of taking the option.
Undoubtedly, the text and
graphics I did find were of a high standard, and Ring of Power was entertaining.
On second thoughts, perhaps it wasn't the game that was annoying, but my constantly falling in pits especially after I had lit the available lamps and should have seen them. Steve Forster

## RATING

## CDS Microsystems

## (Spectrum)

SOME ADVENTURE games try to be arcade games and some arcade games try to be adventure games. Spectrum Safari from CDS Microsystems is one such hybrid and there are some interesting aspects to both sides of the game, but the combination of the two means that what there is in variety is not quite matched in quality

The game begins with you being a survivor from a shipwreck just off the coast of Komongo, a tiny island in the South Atlantic and you are washed ashore clinging to the wreckage. The island and villages are graphically represented on the screen and the idea is to reach the boat in the South East corner of the island. There are three people in your party to start with and you move around the island using the N, S, E and W keys. However, you are soon met by a variety of animals who set various challenges. There are seven challenges possible and fortunately there is a practice mode available so you can become moderately proficient before embarking
on your island wanderings. The challenges include a gambling gorilla, a kicking sheep and some heavy lemmings. The challenges test you very effectively both mentally and physically, for example there is a reaction timer type game, a memory game and a game where you have to read something flashed onto the screen.

The testing of your eyes, reaction and mental ability proceeds as you progress towards the boat and you lose a member of your party each time you fail. At one village on the island you are able to purchase the boat but most villages will sell you food or a native to join your party, but first you have to barter with the natives for a good price.

The practice mode enables you to select any of the seven challenges to try, and this almost obviates the need for the island adventure but the adventure is quite fun and there is a definite sense of humour in the challenges and the fact that there are seven different mini games of reasonable quality means that at least you have value for money.

CR

## RATING



## EXCITING



## MEDIOCRE

## BORING

## DULLSVILLE




VALHALLA is supplied on a 48 K Spectrum program cassette, with VALHALLA player manual and presentation box. As VALHALLA uses the full 48 K RAM microdrives and full-size printers are not supported. ZX printer optional.
VALHALLA is normally available from stock, and orders are despatched by return. If. for any reason we are unable to fulfil your order within 14 days of receipt, we will notify you.
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## GET OFF MY GARDEN!!

## FROM

## iNTERCEPTOR SOFTWARE

(wexirlivis) IAN GRAY

MUSIC BY CHRIS COX
PRODUCED BY RICHARD JONES ON DISK .


## Wheelin' Wallie

NTERCEPTOR SOFTWARE



The problem with buying a home computer, as you may already have discovered, is there's often very little software to go with it. Or all that is available is games, gamés and more games.

There's no such problem, however, with the Commodore 64. It has a more extensive range of serious software than any other home computer.

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You can teach yourself just about any subject
you care to mention, even computer programming
And for the office there are programs like word processing, financial planning, information storage and stock control.

Finally, when you're mentally exhausted, you can even entertain yourself - yes, with games.

When all's said and done, however, we do have to admit that in one respect the Commodore 64 isn't up with the competition. It costs around £229, much less than any comparable machine.

And that's a fact we hope you'll never ever forget.


When you have an enormous memory there's no end to the things you can do.

Please send me further information on: the 64 computer $\square 64$ software $\square$ disk drive $\square$ cassette unit $\square$ printers $\square$ monitor $\square$
Name (Mr. Mrs. Miss)
Address

Send to: The Commodore Information Centre, 675 Ajax Avenue, Slough, Berkshire SL1 4BG. Or telephone (0753) 79292.

# THE SPACE SABOTEURS 



## THE ANT-HILL ALGORITHM

by Fin Fahey

## Cherry blossom time

WELL, THOUGHT Jerry, the Japanese certainly have recovered some style.
It was a fine June morning in Kyato province, and the English agent was approaching the venerable Hakashoma monastery. Carefully landscaped grounds surrounded him, their components arranged with a precise assymmetry utterly alien to Western ideas of planning. Here an arrangement of boulders, approached by a winding path of finely graded gravel, there a grove of cherry trees, branches laden with blossom, hinted at a subtle and benign gamesmanship, a fine exposition of enigmatic theorems unapproachable via the crude mechanics of ordinary language.

## To travel in hope

Jerry filled his bored lungs with richly scented air. The Kyato bullet train, though efficient, was little more than a pressurised projectile. Running in airless tunnels at speeds up to 350 mph , it was a brief, though nonetheless alienating experience.
Jerry had been relieved to find that the Japanese had restored not only their damaged major cities, but also decontaminated the serene rural landscape. In truth, Japanese cities had suffered little compared with those of most industrial countries in World War 3, but the prevailing winds had brought a heavy share of fall-out from the Asian mainland.

## The enigma from the East

Jerry strolled languidly along the path, mentally reviewing his London briefing. He still had no idea what to expect at the Monastery.
". . . but then none of us do exactly, Jerry." Old Major Airdale leaned back to refill his pipe with his usual foul-smelling (but non-carcinogenic) black shag.
"It isn't that Nakasura is being evasive, I'm sure . . . but the messages we get from him seem to make no real sense. You know, Zen Buddhism, and all that. Really, old boy, UN Intelligence is not in business to explain to a Japanese abbot what we think the sound of one hand clapping might be. Enlightening as the answer would be, of course. So, old boy, that's why we're sending you. Personal contact, you see, and besides, you've dabbled in this sort of thing, I understand?"
"Ta'i Ch'i is a little different from Zen, Major - it's more to do with movement, to put it simply. Besides, it's Chinese. Worlds apart really but in any case, aren't you putting the cart before the horse? I really don't know what information we want from Nakasura, and why

## Jerry gets the picture

Airdale coughed apologetically and smoothed back his darkening hair. He was on his first course of anti-age pills and wasn't sure he liked it. Reverting back 15 years in time was playing hell with his self-image. "Of course, Jerry, thought someone would have explained already." He paused to slide a holocube across the table. Jerry pressed the activating
stud. Within the translucent box an insectile structure appeared. A perfect miniature composed of tiny, intricately interlaced girders supporting an immaculately polished series of little tin-foil umbrellas.
Jerry played with the zoom-controls, and the object suddenly acquired scale in his mind. There were minute figures of astronauts in there. Floating around with the help of jet-assist units, they were performing various maintenance jobs on bits of microscopic equipment.

He was looking at an object at least 15 kilometres across.

## Power to the people

For a moment Jerry toyed with the fantasy that he was seeing a real scene, a specimen of some ultra-sophisticated pond life. But no
'Solsat 1, Major?"
"Spot on, old boy, spot on."
Solar satellite One was the first of a series of power satellites built in synchronous orbit with lunar materials. Designed to tap the unlimited solar energies available in space, the first four were already beaming microwave energy down to the vast antenna farms in the Mojave, Sahara and Gobi Deserts. The great cities of the world owed their revival to cheap non-polluting power. The Greenhouse Effect, consequence of the carbon dioxide released by coal and other fossil fuels, had already caused some minor climatic changes - any further $\mathrm{CO}_{2}$ release would be catastrophic.

## Threat from space!!!!

"Now watch, Jerry!" Airdale moved the tape forward. For a moment the scene was as weightlessly serene as ever, then the cube filled with a harsh blue light. Gradually, Jerry saw, the satellite was changing. Structures were sagging and bubbling, girders disolving into glowing globules, the entire geometry of the station altering, warping.
"A beam
"Quite! A broad spectrum laser as far as we can make out, shifted well into the ultra-violet. Sixty-three casualties among the maintenance crew, and the station won't be back in operation for another six months. We traced the beam back . . it came from an object on an earth-grazing course. It fired at about 2000 km out then self-destructed . . . no remains. We haven't released any news to the media of course. Any public alarm could jeopardise the whole solar power program."
"And they may strike again?"
"Nakasura says they will. That huge Artificial Intelligence of his has come up with something. As I say he just won't be specific on the phone. Irritating chap, but brilliant. Do your best, eh, old boy?"

## The way of Zen

Jerry felt some slight trepidation as he breasted the last rise before the monastery. Perhaps the immensely wise Nakasura would find him wanting and refuse to co-operate. He'd researched some Zen riddles - koans - and he felt baffled by even the simplest.


## TOBECONTINUED.

The monastery was a low but extensive tiled structure standing on a gentle rise. It was austere but possessed a certain brooding grandeur. Jerry toiled up the marble steps and paused before the great bamboo doors. Strains of a strange oriental music drifted through the balmy air. He knocked, a little timidly. The great doors swung open.

## Hanging loose

"Hey groovy, man, come right in and swing with the cosmic vibrations!" A diminutive figure wearing green flared loon pants and a tee-shirt sporting the legend: THE NEW STONES - ALL-NIPPON TOUR 2003, jived across the elegantly-tiled floor to shake Jerry's hand enthusiastically. Jerry suddenly identified the curious music - it was a recent single by Ricky Uishnu and the Universal Souls entitled "Tune your Mind to the Colours from Space". Jerry shuddered. He looked down on the so-called New Pop, feeling it to be a stale repetition of old cliches. He liked his music cleanly down-to-earth and took pride in his collection of pre-war Tamla and Ska singles.
"Hey man, neat threads!" It was clear that Jerry's blue UN jump-suit had struck a chord.
"I've come to see Dr Nakasura . . ."
"Well, like wow, man, you're in the groove! Talkin' to the main man, dig my drift, daddy?"
The good doctor beamed cherubically. Japanese, aged about 35 and as unlike a venerable monk as you could get. Jerry decided to accept the information.
"I'm Jerry Cornwall of UN Intelligence. I understand that you can . . . er enlighten us as to the cause of the recent attack from space?"
The scientist rubbed his chin thoughtfully.
"Well like yes and no, man. See when you talk to MANIAC ya gotta go with the flow kinda thing, you hip to my concept, man?"
Jerry gave up any attempt at understanding and simply raised an eyebrow.
"MANIAC
"Machine-ANt Intelligence And Consultations, guy! It's a sweet, sweet system!"
"Ants.
Nakasura gave up on Jerry.
"Pictures worth a thousand koans, dig? Follow me and get hip!" Jerry followed.
"Hey, what kinda sounds you groove to?"
Jerry sighed.

## The bugs in the machine

Jerry was led through a series of richly tapestried and cushioned rooms, heavy with the smell of joss-sticks.
. . and where are the monks now, Doctor?"
He was maintaining some semblance of polite conversation.
"No monks, man, cleared out 'cos of the fall-out, dig? All left for San Francisco after the war, I hear. Government leased the place to good Nakasura for research. Only me here, breathing deeply of the age-old atmosphere of wisdom and so forth. They still call me the Abbot, though. But hey, you can call me Hoshi, yeah?"

They entered a huge glass-walled room. Behind the glass was a crosssection of a honeycomb of passages.
"Formicarium, man! These babies here you dig are kind of like a front-end processor, know what I'm zoning in on? A new strain, recombinant DNA mutant, weird thingoids, huh?"
Indeed they were. The ants moving about their business behind the walls were each about six inches long, bright red and appeared to have at least eight pairs of antennae each.
One wall of the room was covered in fairly conventional computer equipment. Nakasura walked over to it.
"OK, man, here's the spiel! What we have here is the perfect integraton of machine and insect intelligence."
Nakasura began to sound a bit more precise as he spoke about his specialism.
and so, Jerry, the entire globe is covered with a network of miniature ant societies, all interconnected, even different species, through an enormous range of senses. Chemical, magnetic, you name it. The perfect data collection network, you dig. All MANIAC does is tap into this vast machine and interpret the results. Ants ain't got no self-awareness, see, 'cept maybe collectively, and then not a lot. But the computer supplies that. Based on a Cray 13, but with some of my enhancements. Anyway, nothing happens on this far-out old planet without a few ants somewhere nearby."

## The Haiku hassle

"So, Doctor, your machine can tell us if this strange beam is being controlled by someone on Earth?"
"Well, not so fast, Jerry, see MANIAC is a bit moody. It sort of hints at things you see. All depends on whether it digs your vibes. It does have true self-awareness . . ." He finished apologetically.
and it communicates in Haiku."

## 'Haiku?"

"Yes, it's a fad it's into! It used to talk like any regular machine, but it's taken to expressing everything as seventeen syllable Japanese poems. A real headache, I can tell you - I shouldn't've fed it all that historical background. It's told me about this beam and it knows something about it but that's all I can get. You try, guy!"
He threw Jerry a small hand mike.
"Hello, MANIAC!"
"MANIAC here." A vast mechanical voice boomed out.
"Hey, what bands are you into?"

## Living in the past

Things were looking up. After they'd discussed the role of soul music in the youth disturbances of the late ' 60 s , argued whether Down in the Tube Station at Midnight had marked the start of The Jam's decline as a creative force, and agreed that music just wasn't a force to Change the World any
more, Jerry found that he was enjoying himself. Doctor Nakasura meanwhile had slipped on some headphones and was listening to a portable stereo with a rapt expression. Eventually Jerry felt confident enough.
". . . and what do you know about the destruction of our power satellite, MANIAC? Just by the way, of course."
The machine produced a sound closely resembling a chuckle.
"No sweat, Jerry, but drop by again, y'hear!"
A line printer began to chatter.
"There you go, everything you need. Be seeing you!"
MANIAC signed off. To Jerry's ears it had sounded distinctly peeved.

## A bit of information

Jerry trudged away from the monastery, fuming quietly. They'd raised MANIAC again, but all it would talk about was the latest rumour that Jim

Morrison was alive and working on a South Pacific algae farm. So all Jerry was left with was a Haiku:

## A RICH LAND HIDES FIVE ENLIGHTENED FACES CLEANSING WEIGHT REVEALS THEIR STATE.

Senseless as far as he was concerned, but then he'd never been that good at word games. This was a job for London - maybe Anna could make something of it. One of these days, he thought, he'd give up intelligence work and become a pop singer.

## End of Episode One

The Space Saboteurs continues next month with Episode Two: THE MEGADEATH MEN
In which Anna makes a Big Mistake, and Jerry meets the Top Brass.


## HAIKU PROGRAM

YOUR LITTLE home computer may not have the allembracing global capacity of MANIAC, or a devout interest in Pop Music, but with this small piece of Artificial Intelligence software you can certainly get it to produce an enigmatic Haiku or two.

Haikus are simple Japanese poems, their subject matter is nature, and they seek to portray the mood of the poet by projecting it on to his or her surroundings. Some Westerners such as Allen Ginsberg have sought to expand the subject matter, and you may find that your computer produces something more akin to Beat poetry than classical Japanese Haiku depending on your choice of vocabulary.
This program is an extremely simple example of how to construct artificial English. It relies on two things, a word list, sorted into various parts of speech, and an outline sentence structure which provides slots into which these words can be dropped. Since we're interested in counting syllables, we further classify the list into one-, two- and three syllable words. The Sinclair program does not count syllables as this slowed it down too much. By keeping track of syllables, you could also produce Western poetry and ensure that it scans.
The word list is placed as DATA statements from line 5000. Each part of speech/syllable category is terminated by a " $P$ " and new words can simply be introduced in DATA statements before the " $\rho$ ". Thus you can expand the program's vocabulary as far as you want.
Sub-routine 4000 Reads the word-list into the appropriate two-dimensional string arrays.
Now we can construct sentences. In English, there are a number of ways to construct the simplest sentence, so we have simplified the process hugely. Furthermore we do not handle prepositions in this program. I leave you to contemplate the fun and difficulties of using by, to, with, from and so on with randomly selected verbs and nouns. It can be done, but you'll need more word classifications.

I settled on two types of sentence structure. The first uses an intrasitive verb, that is a verb not requiring an object clause and has the structure:
[adverb],/noun clause/[adverb]/verb/[adverb]
There is only one adverb, but it has three possible positions as shown by the square brackets.
The second type of sentence uses a transitive verb, which needs an object, and thus has two noun clauses thus:
[adverb],/noun clause 1/[adverb]/verb/noun clause 2/ [adverb]

Where again the adverb has three positions.
Noun clauses are constructed by a separate subroutine at line 3000 . They consist of an article, definite- "the" or indefinite- "a" or "an", to distinguish between the last two, the program scans the first letter of the next word to see if it is a vowel. The article is followed by an optional adjective and then a noun.
Each Haiku poem is presumed to consist of two sentences, each of which can be of either type. All words are chosen randomly by the sentence structure routines at 1000 or 2000 . In the ORIC program, if the syllable count is wrong, the whole sentence is rejected. This took too long on the Spectrum. The Spectrum also requires the surplus spaces trimmed off its fixedlength array strings. This is done in line 3500 .
A program like this is just a starting point really. As I've said, English allows a wide range of play with sentence structure, possible improvements are endless. Aside from handling prepositions, you could use conjunctions to link sentences. There is the knotty question of verb tenses, and also subordinate clauses, and what about pronouns? You may or may not choose to boldly split infinitives, but I'm sure you'll find plenty of scope for experiment here.

## Line Numbers:

| 100 | Control Section. |
| :--- | :--- |
| 200 | Sub-routine to construct on Haiku. |
| 100 | Sub-routine to construct sentence type 1 |
| 2000 | Sub-routine to construct sentence type 2 |
| 3000 | Sub-routine to construct noun clauses. |
| 4000 | Sub-routine to initialise program. |

Data Statements:

| 5000 | Single-syllable words. |
| :--- | :--- |
| 9000 | Two-syllable words. |
| 1300 | Three-syllable words. |

Two-dimensional arrays:
AJ\$(X,Y) : Adjectives
N\$(X,Y) : Nouns.
V1\$(X,Y) : Intrasitive verbs.
V2\$(X,Y) : Transitive verbs.
AV\$(X,Y) : Adverbs.
Where X represents number of syllables, Y represents the word number.

## Different for

the Spectrum.
NW() Number of words in each category by syllables and parts of speech.

## Other Arrays:

VO\$ : List of vowels.

## Variables:

NS
SE
X,N,M,Z
T1
T1
TL
L1
AP
SS

Strin
W\$
X $\$$
C $\$ ~$
L1
AP
SS
S
trings:
W\$
X\$
C\$
S\$

Number of syllables (ORIC only)
Number of sentences.
General purpose variables.
First sentence type
Second sentence type
Syllable count (cumulative).
Sentence 1 length.
Adverb position indicator.
Current word, number of syllables.

General-purpose string. Input string.
Noun clause sub-string.
Sentence (output) string

| Haiku Generator |  |
| :---: | :---: |
| 20 | REM Fin Fahey |
| 30 | FEM Feb 1984 |
| 40 | REM Sinclair Spectrum |
| 50 | REM |
| 60 | REM |
| 70 | REM |
| 100 | GO SUB 4000 |
| 110 | GO SUB 200 |
| 120 | PRINT AT 12，5；＂Another poem |
| （Y／N）？＂ |  |
| 130 | LET $\times$ 事＝INKEY事：LET $x=$ FND |
| 135 | IF $\times$ 事＝＂＂THEN GO TO 130 |
| 140 |  |
| 150 | IF $x$ 事＝＂y＂THEN GO TO 110 |
| 160 | GO TO 130 |
| 196 | REM |
| 197 | REM |
| 198 | FEM Construct one |
| 199 | REM |
| 200 | REM |
| 205 | LET $\mathrm{t} 1=\mathrm{INT}(\mathrm{FNND} * 2)$ ：LET $\mathrm{t} 2=$ |
| INT（RND＊2） |  |
| 210 | CLS ：FOF $x=1$ TO 4：FRINT |
| NEXT $\times$ |  |
| 220 | IF $t 1=0$ THEN GO SUB 2000 |
| 230 | IF $t 1=1$ THEN GO SUB 1000 |
| 245 LET 11＝51 |  |
| 247 | FRINT s事；＂．＂ |
| 249 FEM |  |
| 250 | IF $t 2=0$ THEN GO SUB 2000 |
| 255 IF $t 2=1$ THEN GO SUB 1000 |  |
| 270 | FRINT 5事；＂．＂ |
| 290 RETURN |  |
| 996 | FEM |
| 997 FEM |  |
| 998 | FEM Sentence Type 1 |
| 999 FEM |  |
| 1000 LET s丰＝＂＂：LET c事＝＂＂ |  |
| 1003 LET $51=0$ |  |
| 1005 | REM Initial adverb？ |
| 1010 LET $a p=1+$ INT（FND＊8） |  |
| 1020 | IF ap $>1$ THEN GO TO 1070 |
| 1030 GO SUE 3500 |  |
| 1060 LET 5 ${ }^{\text {a }}=5$ 5＋＂， |  |
| 1070 GO SUB Jo00 |  |
| 1187 | FEM Adverb？ |
| 1190 LET si＝ssolc事＋＂＂ |  |
| 1195 IF $a p<>2$ THEN GO TO 1220 |  |
| 1200 GO SUB 3500 |  |
| 1210 LET s事＝5 ${ }^{\text {c }}+{ }^{\text {c }}$ |  |
| 1215 | REM Verb |
| 1220 LET $5 s=1+$ INT（RND＊2） |  |
| 1230 LET $x=1+$ INT（RND＊w $(55,3)$ |  |
| 1240 LET sl＝sl＋ss |  |
| 1250 LET $\omega$ w $=$－ut $(55, x)$ |  |
|  5＂ |  |
|  |  |
| 1280 FEM Adverb？ |  |
| 1285 IF ap＜＞S THEN GO TO 1300 |  |
| 1287 LET s事＝5事＋＂＂ |  |
| 1290 GO SUB S500 |  |
| 1300 FEETUFN |  |
| 1996 REM |  |
| 1997 FEM |  |
| 1998 | FEM Sentence Type 2 |
| 1999 FEM |  |
| 2000 LET 5 韦＝＂＂：LET c＊$=$＂$":$ LET |  |
|  |  |
| 2005 | FEM Initial Adverb？ |
| 2010 LET $a p=1+$ INT（FND＊8） |  |
| 2020 IF ap $>1$ THEN GO TO 2070 |  |
| 2030 GO SUB 3500 |  |
| 2040 LET 5 $=5$ ¢ ${ }^{\text {a }}$＋＂，＂ |  |
| 2060 REM Noun Clause |  |
| 2070 G0 SUB 3000 |  |
| 2080 LET 5事＝5i＋c車＋＂＂， |  |
| 2085 | FEM Adverb？ |
| 2090 | IF $a p<>2$ THEN GO TO 2140 |
| 2100 | GO SUB 3500 |

2110 LET 5丰＝5事＋＂＂
2140 LET $s s=1+$ INT（RND＊2）
2150 LET $x=1+$ INT（RND＊w $(55,4)$ ）
2160 LET $51=51+55$

 5 ＂
2185 FEM Noun clause
2190 GO SUB 3000

2197 FEM Adverb？
2200 IF ap＜＞S THEN GO TO 2300
2205 LET 5 事＝5车＋＂
2210 GO SUB 3500
2300 RETUFN
2996 FEM
2997 REM
2998 REM Noun Clause
2999 REM
3000 LET C丰＝＂＂
3005 LET $x=$ INT（FND＊2）
3007 FEM Adjective before？
3010 IF $x=0$ THEN GO TO 3100
3020 LET $55=1+$ INT（FND＊2）
30SO LET $x=1+$ INT（FND＊w（ 55,1$)$ ）
3040 LET $51=51+55$
3050 LET $w=$ a⿻三丨 $(55, \%)$
3070 GO SUB 3700

3090 FEM Noun
3100 LET $\quad 5 s=1+$ INT（FND＊2）
3110 LET $x=1+$ INT（FND＊W $(55,2)$ ）


[^3]

5030 DATA＂CLEAR＂，＂SLOW＂，＂SWEET＂ ，＂ROUGH＂
5900 DATA
6000 FEM NOUNS
6010 DATA＂MOON＂，＂SEA＂，＂LAKE＂，＂S KY＂，＂CRANE＂，＂GOOSE＂，＂TREE＂，＂SUN＂ ＂＂SNOW＂，＂FAIN＂，＂CLOUD＂
6020 DATA＂WIND＂，＂KNIFE＂，＂BIRD＂， ＂HORSE＂，＂OX＂，＂DOG＂，＂CAT＂，＂MAN＂，＂ FlIEST＂，＂MONK＂
GOBO DATA＂KING＂，＂QUEEN＂，＂SWORD＂ ，＂AXE＂，＂LAMP＂，＂HOUSE＂，＂FATH＂，＂GR ASS＂，＂ROCK＂，＂FROG＂
6040 DATA＂GHOST＂，＂ROAD＂，＂LAND＂，
＂LEAF＂，＂BRANCH＂，＂AFMY＂，＂STAF＂，＂L AE＂，＂MIST＂，＂BOY＂
BOLO DATA＂GIRL＂，＂SNAKE＂，＂SONG＂， ＂FOES＂，＂BOOK＂，＂FISH＂，＂BROOK＂
6900 DATA＂／＂
7000 FEM VERBS 1
7010 DATA＂FLEE＂，＂FALL＂，＂SLEEEF＂
＂OFEN＂，＂SFEAK＂，＂SHOUT＂，＂SWIM＂，＂FR
UN＂，＂WALK＂，＂CRIE＂，＂LEAF＂
7020 DATA＂DIE＂，＂SING＂
7490 DATA＂／＂
7500 REM VERBS？
7510 DATA＂HOLD＂，＂TOUCHE＂，＂CALL＂ ，＂LOVE＂，＂HATE＂，＂WANT＂，＂CLIME＂
7520 DATA＂STROKE＂，＂TEAR＂，＂HEED＂
，＂SOOTHE＂，＂FLENSE＂
7900 DATA＂／＂
8000 FEM ADVEFIES
8010 DATA＂／＂
8996 FEM
8997 FEM 8998 FEM

## 2 SYLLABLE WORDS

9000 REM ADJECTIVES
9010 DATA＂HOLY＂，＂SACRED＂，＂LONE Y＂，＂ANCIENT＂，＂WIND－SWEFT＂，＂FEAR UL＂
9020 DATA＂JOYFUL＂，＂HAFFY＂，＂ANGR Y＂，＂YELLOW＂，＂MOURNFUL＂，＂CAREFUL＂ 90 SO DATA＂CARELESS＂，＂HEAVY＂，＂WA FY＂，＂UGLY＂，＂LOVELY＂，＂HANDSOME＂ $9040^{\circ}$ DATA＂BUFINING＂，＂WEEFING＂，＂D YING＂，＂GHOSTLY＂，＂BROODING＂ 9050 DATA＂LOATHSOME＂，＂GENTLE＂，＂ TRANQUIL＂，＂FEACEFLL＂＂WEARY＂
9060 DATA＂CHEERFUL＂，＂CLEVER＂，＂H

EL＿FFUL＂，＂LEARNED＂，＂CURIOUS＂
9070 DATA＂TENDER＂，＂TUNEFUL＂，＂AN pIOUS＂
9190 DATA＂／＂

## 9200 FEN NOUNS

9210 DATA＂SCHOLAR＂，＂SPARROW＂，＂E AGLE＂，＂OCEAN＂，＂RIVER＂－＂SOLDIER＂ 9220 DATA＂TEMPLE＂，＂STATUE＂，＂MEF CHANT＂，＂PLANET＂，＂TAILOR＂，＂CASTLE

9250 DATA＂INSECT＂，＂LOVER＂，＂SUNS ET＂，＂MOONRISE＂＂PEASANT＂，＂WOMAN＂ 9240 DATA＂SUNFISE＂，＂LIZAFD＂，＂MO UNTAIN＂，＂FOREST＂，＂HERMIT＂，＂SA LAO N＂
9390 DATA＂／＂
9400 FEM VERBS 1
9410 DATA＂IDLE＂，＂FLUTTEF＂，＂MUTT ER＂，＂CHATTER＂，＂FLITTER＂，＂FALTER＂ 9420 DATA＂FONDER＂，＂WITHER＂，＂RIF EN＂，＂HASTEN＂，＂MARCHE＂，＂LISTEN＂
9430 DATA＂REFLECT＂
9590 DATA＂／＂
9600 REM VERBS？
9610 DATA＂HINDER＂，＂CURSE＂，＂FRIG HTEN＂，＂DEL IGHT＂，＂SADDEN＂，＂BURDEN ＂
9620 DATA＂VISIT＂，＂WATCHE＂，＂STAR TEE＂，＂INSFIFE＂，＂WELCOME＂
9790 DATA＂／＂
9800 REM ADVERBS
9810 DATA＂SLOWLY＂＂CLEARLY＂，＂FF＂ EELY＂＂＂LOUDLY＂，＂SOFTLY＂，＂ROUGHLY

9820 DATA＂SWEETLY＂，＂FURELY＂
9900 DATA＂／＂


ORIG


[^4]```
2140 SS=INT (1+RND (1)*3)
    2150) X=INT (1+FNND (1)*NW (5S,4))
    2160 SL=SL+SS:S车=S真+V2夆(SS,X)+"S"
    2170 GOSUB 3000
    2180 5本=5ま+C実
    2190 REM ADVEFE?
    2200 IF AF<<3 GOTO 23OO
    2210 SS=INT (2+FiND (1)*2)
    2220 X = INT (1+FNND (1) *NW (5S,5))
    22उO SL=SL+SS:S*:=S*+" "+AV直(SS,S)
    2300 FETURN
    2996 FEM
    2997 FEM
    2 9 9 8 ~ F I E M ~ N O U N ~ C L A U S E ~
    2999 REM
    3000 C轫""
    3005 X=INT (FND (1)*2)
    3010 IF }X=0\mathrm{ THEN GOTO }$10
    SO20 SS=INT (1+RND (1) *S)
    SOSO X=INT (1+RND (1) *NW (SS,1))
    SO40 SL=SL+SS:C本=AJ夆(SS,X)+""
    SO5O FEM DO NOUN
    3100 SS=INT (1+FNND (1) *3)
    3110 X=INT (1+\operatorname{RND (1) *NW (SS,2))}
    3120 SL=SL+SS+1
    3130 C $ = C = + +N= (SS,X)
    $140 REM DO ARTICLE
    3150 IF INT (RND (1)*2)=1 THEN C*="THE "+C&:G0TO 32O0
    3160 Z=0
    3170 FOR }x=1\mathrm{ TO S: IF LEFT* (C&z,1)=VO& (x) THEN }z=
    $180 NEXT X
    3185 IF C % =" "THEN STOF
    3190 IF Z=0 THEN C丰="A "+C来
    3195 IF }Z=1 THEN C $="AN "+C c
    3200 FETUFN
    3996 REM
    3 9 9 7 ~ R E M
    3998 FEM SET UF EVEFYTHING
    4000 NS=17:SE=2
    4005 DIM AJ事(S,100),N事(3,100),V1东(S,100),V2&(3,100), A
生(3,100),NW(3,5)
```



```
4)="0":VO車(5)="い"
    4010 FOR }X=1 TO उ
    4 0 2 0 ~ z = 0
    4 0 3 0 ~ Z = Z + 1
    4040 READ W*: IF W*="/" GOTO 4100
    4050 AJ聿 (X,Z)=W*
    4060 GOTO 4030
    4100 NW (X,1) =Z-2: Z=0
    4110 Z=Z+1:READ W*:IF W*="/" GOTO 4200
    4120 N* (X,Z)=W年:GOTO 4110
    4200 NW (X,2)=Z-2: Z=0
    4210 Z=Z+1:READ W事:IF W*="/" GOTD 4300
    4220 V1专(X,Z)=W$:GOTO 4210
    4300 NW (X, 3) =Z-2:Z=0
    4310 Z=Z+1:READ W*:IF W*="/" GOTD 4400
    4320 V2央(X,Z)=W圭:GOTO 4310
    4400 NW (X,4)=Z-2:Z=0
    4410 Z=Z+1:READ W年:IF W*="/" GOT0 4500
    4420 AV害(X,Z)=W$:GOTO 4410
    4500 NW (X,5)=Z-2
    4510 NEXT X
    4 9 0 0 ~ R E T U R N N
    4 9 9 6 ~ R E M M
    4 9 9 7 ~ R E M
    SINGLE SYLLAELE WOFDS
    4 9 9 9 ~ F E E M
    5000 REM ADJECTIVES
    5 0 1 0 ~ D A T A ~ F I E D , G F E E N , O L D , ~ Y O U N G , S T I L L , S A D , ~ B F O W N , ~ E L ~ A C Y , ~ W ~
HITE, WISE, FAT, THIN
```



```
E,SOFT,RICH,SICK
    5 0 3 0 ~ D A T A ~ C L E A R , ~ S L O W , ~ S W E E T , ~ R O U G H ~
    5 9 0 0 ~ D A T A ~ /
    GOOO FEM NOUNS
    6 0 1 0 ~ D A T A ~ M O O N , S E A , ~ L A K E , S K Y , ~ C R A N E , G O O S E , ~ T R E E , ~ S U N , ~ S N O W ~
    ,RAIN, CLOUD,WIND, KNIFE
    6O2O DATA EIFD,HOFSE,OX,DOG, CAT,MAN,FFIEST,MONK, FING,
QUEEN, SWORD, AXE, LAMF
    6OSO DATA HOUSE, FATH,GFASS, FOCK, FFOGG, GHOST, FOAD, LAND
LEAF, BFIANCH, AFMM
    604O DATA STAR, LAKE,MIST, BOY,GIFIL,SNAFE
    6OSO DATA SONG,FOET, BOOK,FISH, BROOK
    6 9 0 0 ~ D A T A ~ / ~
    70OO REM VERESI
    7 0 1 0 ~ D A T A ~ F L I E , F A L L , S L E E F , O F E N , ~ S F E A K , , ~ S H O U T , ~ S W I M , ~ F U N , W ~
ALK,CFIE,LEAF,DREAM
    7020 DATA DIE,SING
    7 4 9 0 ~ D A T A ~ / ~
    7500 REM VEFRSS2
7 5 1 0 ~ D A T A ~ H O L D , ~ T O U C H E , ~ C A L L , ~ L O V E , ~ H A T E , W A N T , C L T M E ~ S T F O F :
E,TEAR, HEED
7520 DATA SOOTHE,FLEASE
```

7900 DATA／
BOOO FEEM ADVERES
8010 DATA／
8996 FEM
8997 REM
8998 FIEM TWO SYLLABLE WORDS
9000 REM ADJECTIVES
9010 DATA HOLY，SACRED，LONELY，ANCIENT，WIND－SWEFT，FEAFF UL，JOYFUL ，HAFFY，ANGRY
9020 DATA YELLOW，MOURNFUL，CAREFUL，CARELESS，HEAVY，GALL ANT，WARY，UGLY，LOVELY
$9 O \Xi O$ DATA HANDSOME，BURNING，WEEFING，DYING，GHOSTLY，BFOO DING，LOATHSOME，GENTLE
9040 DATA TRANQUIL，FEACEFUL，WEAFY，CHEERFUL，CLEVEF，HEL FFUL，LEARNED，CURIOUS
9050 DATA TENDER，TUNEFUL，ANXIOUS
$9900^{\circ}$ DATA
10000 FEM NOUNS
10010 DATA SCHOLAR，SFARFOOW，EAGLE，OCEAN，FIVER，EANNEF， 5 OLDIER，TEMFLE，STATUE
10020 DATA MEFCHANT，FLLANET，TAILOF，CASTLE，INSECT，LOVER ，SUNSET，MOONFISE
10030 DATA PEASANT，WOMAN，SUNFISE，LIZAFD，MOLINTAIN，FOFE ST，HERMIT，SALMON
10900 DATA／
11000 REM VEFBS 1
11010 DATA IDLE，FLUTTEF，MUTTEF，CHATTEF，FLITTEF，FALTER ，FONDER，WITHER
11020 DATA FIFEN，HASTEN，MAFCHE，LISTEN，REFLECT
11490 DATA／
11500 FEM VERES2
11510 DATA HINDEF，CUFSE，FFIGHTEN，DEL IGHT，SADDEN，BURDE
N，VISIT，WATCHE，STARTLE
11520 DATA INSFIFE，WELCOME
11900 DATA／
12000 FEM ADVEFBS
12010 DATA SLOWLY，CLEAFLY，FFEELY，LOUDLY，SOFTLY，FOOUGHL
Y，SWEETLY，FURELY
12900 DATA／
12996 FEM
12997 REM
12998 FIEM
12999 REM
13000 REM
THREE SYLLABLE WORDS
ADJECTIVES ENT
13020 DATA EEAUTIFUL，MASTERFUL，INNOCENT，PENTTENT，FELU CTANT
13030 DATA DESOLATE，FEGFETFLIL，BOISTEFOUS，AMOUFOUS，SUS
FICIOUS，HESITANT
13900 DATA／
14000 REM NOUNS
14010 DATA WAFiRIOR，SAMURAI，EMFEFORF，WANDERER，JUNIFER，C
ICADA，CHERRY TREE
14020 DATA TRAVELLER
14900 DATA／
15000 FEM VEFES
15010 DATA MEDITATE，CONTEMPLATE
15020 DATA HESITATE，CALCULATE，REMEMEEF
15490 DATA／
15500 REM VERBS2
15510 DATA ENTEFTAIN，OVERAWE，ENL IGHTEN，IMF＇ASSION，ENCI RCLE，AMAZE，EMEOL DEN
15900 DATA／
16000 REM ADVERES
16010 DATA HOFEFULLY，THANKFULLY，TEAFFULLY，RAFIDLY，LAN GUIDLY，ANXIOUSLY
16020 DATA WISTFULLY，LISTLESSLY，DISTANTLY，FRETTILY，GF ACEFULLY，TEMPTINGLY
16900 DATA／


## Three c



A rubbish bin for your old
has been.

Believe it or not, computers often suffer from amnesia.
$99 \%$ start off with large enough memories, but operating functions like text, colour, sound and more particularly high resolution graphics, take large bytes out of them. Leaving very little "useable" memory for programming and games.

Not so the new Oric Atmos 48K.
This is the one home computer that takes these normal working functions in its stride.

Unlike other home computers it uses the highly sophisticated serial attribute handling method used by Viewdata and Teletext,
in which the attributes are stored on the screen alongside the data, instead of taking up space in the memory.

Thus the Oric Atmos never offers less than a healthy 37 K of useable memory - even when the new colour printer and disc drive unit are attached. (Technical buffs see details overleaf).

So it rivals the performance of the supposedly larger, more expensive Commodore 64 K , which unfortunately loses 26 K of its "elephantine" memory in high resolution graphics.

It beats its immediate competitors like the Sinclair Spectrum, Dragon 32K, Vic 20 and Atari 600.

## Now we've whetted your appetite, here's something to get your teeth into.

## Printer Technical Specifications

Printer/
Ball Point Pen, 4 colour
Plotting
Plotting speed:
(horizontal)
(vertical)
Printer
Speed
Resolution
Effective
plotting
range
Characters perline
Characters
perline
Accuracy
(repetition)
(movement)
(distance)
Penlife
Parallel
interface
Temperature
range
storage
Humidity
range
supply
Dimensions

Power Switching power supply input
$52 \mathrm{~mm} / \mathrm{sec}(2.05 \mathrm{ips})$
$73 \mathrm{~mm} / \mathrm{sec}(3.08 \mathrm{ips})$
12 characters per second
$0.2 \mathrm{~mm} / \mathrm{step}$ ( 0.00787 inch)
96 mm ( 3.804 inch) xaxis, divided into 480 steps. (No limit in y direction)
80 or 40 text mode (determined by software in graphics mode)
INT $(480 / n+1)$ * 6 )
for $0=n=15$
0.2 mm max
0.3 mm max
$0.5 \% \max (x-a x i s)$
1\% (y-axis)
250 metres ( 825 feet)
8-bit parallel Uses STROBE and ACKNOWLEDGE
18.3 to $35^{\circ} \mathrm{C}\left(65\right.$ to $\left.96^{\circ} \mathrm{F}\right)$
-40 to $71^{\circ} \mathrm{C}\left(.40\right.$ to $160^{\circ} \mathrm{F}$ )
$10 \%$ to $80 \%$ relative noncondensing

100-120VAC
200-240 VAC
$10^{3 / 4} /^{\prime \prime}$ wide
67/8" deep
$2^{1 / 2} 2^{\prime}$ high

## Atmos Technical Specifications

CPU
Memory
Memory
(48K Model)

Language
Keyboard

Display
Textformat
Character
set

Graphics
Graphic
Facilities
Sound

Storage

Interface

Other

6502A
Choice of 16K or 48K RAM
Minimum 48K RAM, max 64 :
16K ROM external control signals allow use of full 64 K RAM or maybe used externally to increase ROM/RAM
Extended Microsoftbasic
Typewriter style and pitch, 57 keys, standard computer layout, additional cursor control keys, autorepeat facility, tactile and acoustic feedback
Output for B\&W or colour TV, RGB output for colour monitor. 40 line $\times 28$ rows
Similar to Teletext format, standard ASCII double height, flashing, 80 user definable characters
$240 \times 200,8$ colours
Points, lines, circles
Internal loudspeaker and amplifier. 3-Channel sound synthesiser envelope control, amplitude control 8 octaves, noise channel
Most cassette recorders via DIN socket 300 or 2400 BAUD. Disc Drive.
Centronics, expansion port, Hi-fi,RGB Monitor,UHFTV, cassette recorder
Warm reset to regain control without clearing program or data

## Micro Disc Technical Specifications

Formatted Capacity
No. of
Tracks
No. of
Sectors
Bytes per
Sector
Transfer
Rate
Supports up to 599 files per side, four drives single or double sided, 40 or 80 track. User definable configuration allows mixing of drive types
including $51 / 4^{14}$ (five and a quarter inch)
Extensive wild card facilities
Copy allows merging of basic and machine codefiles
Utilities
The Utilities are as follows:

| 1. Backup | Copy a whole disc |
| :--- | :--- |
| 2. Copy | Copy a file to another |
| 3. Del | Delete a file allowing wildcards |
| 4. Dir | Display directory listing |
| 5. Drv | Set the default drive number |
| 6. Format | Format and initialise a disc |
| 7. Load | Load a file (code data or basic) |
| 8. Protect | Change protect status of file |
| 9. Recall | Recall a basic array from a file |
| 10. Ren | Rename a file |
| 11. Save | Save a file (code, data or basic) |
| 12. Store | Store a basic array as a data file |
| 13. Sys | Change system configuration |

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# GRAPHICS 

## Boris Allen tells you how to make the most of the graphics capabilities for the CBM 64

ONE OF the most important features of the Commodore 64 computer is the extensive use of the PEEK and POKE commands.
However, in the CBM 64 Microcomputer User Manual there is only a short section on pages $60-62$, with little additional sections on pages 123 and 126. The amount of detail necessary to use PEEK and POKE constructively is rather more than this.

## The television screen

The form of the POKE statement is
POKE address, bytevalue
where the address is a value between 0 and 65535, and refers to a location in memory called a "byte" (the 64 K memory of the CBM 64). To find your way around memory requires "memory maps", but the manual does not really provide many.
Without memory maps we really are POKEing around in the dark, and the only memory maps in the manual are for screen memory and colour memory. You have to be really careful how you use POKE, unless you have a memory map at hand: if you only have the manual, then try out POKEs you have been recommended to use.

One patch of memory it is safe to use is from 40960 to 49151 , because this is the area of memory given up to the CBM 64 BASIC ROM. ROM means Read Only Memory, and so though you can PEEK at the value in that location - whatever you POKE will not affect the content of the location. There are other safe places, and some safe places where it is possible to change the contents of the byte stored at a location. Turn to page 63 of your manual.
On page 63 is a memory map which shows the layout of the screen on the CBM 64, with 40 characters across ( 0 to 39 ) and 25 lines down ( 0 to 24). This gives a total of $40 \times 25=1000$ different characters which may be on the screen at the same time. It should be noted that the first element is usually called 0 , whether it be row or column (or array).

Each of the 1000 locations shown (from 1024 to 2023) contains a token, which stores information about what is supposed to be on the screen in the corresponding position. The screen is said to be "memory mapped", but the term mapping is that used in mathematics not that used in cartography.
Corresponding to the screen memory map, there is a colour memory map (manual page 64) which shows another set of memory locations (from 55296 to 56295). Each location gives the code corresponding to the colour shown at the appropriate screen position. The colour codes are those given on page 61 of the manual.

To change the colour of the character being shown at the top left corner of the screen, we have to change the value stored in location 55296. The colour code for black is 0 , and so
will change the colour at the top left to black.

## Changing colours

Hold down SHIFT and CLR/HOME, and then turn to page 133 of your manual. Find the number 65 (in the coloumn headed POKE), and then note that under SET 1 there is a spade and under SET 2 there is the letter A. POKE a spade into the bottom left corner, coloured black:

SET 1 to SET 2). The change is reversed by SHIFT and $\mathrm{C}=$, and so return to the usual (default) SET.
Next try
and a sombre (all black) picture is produced. Location 53280 controls the border colour, and location 53281 gives the background colour (page 60 in the manual). The background is black, so
makes the spade "disappear" as it is the same colour as the background. Carefully move the flashing cursor down by use of RETURN, and when the bottom line is reached the spade appears in the cursor, and disappears, and appears

## Low resolution graphics

It is possible to plot lines on the television screen by using POKEs, and our first attempt will be A LINE OF BLOCKS. To draw lines using the 1000 character locations is called "low resolution" graphics, or "block graphics" (see my book "Graphic Art for the C64", Appendix G).
This first program is rather short, and when RUN turns the screen white all over (background and border). A line of chequered blocks (video code 102) then runs diagonally down the screen to the right.
The program clears the screen by CHR $\$(147)$ and then the two POKEs set the background and border to the same colour, i.e. white. The only reason this is done is that it looks rather effective when the line is drawn.

There are 40 columns ( 0 to 39 ) and 25 rows ( 0 to 24) and a single line has to be drawn. We draw, therefore, on each row, ignoring some of the columns. The row number is indexed by the loop counter Y (from 0 to 24), and for each row we select the corresponding column. The column is indexed by the variable X , and X is made equal to Y.

The "point" is plotted at line 150 by POKEing a value into the location corresponding to the intersection of the appropriate row and column (or, in other terms, the co-ordinates of the point). The value which is POKEd is 102 , that is, the video code corresponding to a chequered square (page 135 of MUM, SET 1). This character is called the "chequer".
After the line of chequers has been drawn, so as not to interfere with the display (the line is so amazingly pretty), we have the endless loop at line 170 (i.e. 170 GOTO 170). To finish the program use the STOP key. To return to the initial state, before we made the colour changes, press STOP and RESTORE at the same time.

A more adventurous program is ANOTHER LINE OF BLOCKS. The idea behind this program is to draw from the top left to bottom right corners. At column 0 we have row 0 , and at column 39 we have row 24: each column is there-
fore worth about (is exactly) $25 / 40$ rows. The gradient of the line is thus 25 in 40 (or .625).
This second program is effectively the same as the previous one, until we come to the calculation of $S$ in line 110. $S$ stores the value of the gradient (i.e. $25 / 40=.625$ ), and as there are more columns than rows we have to step through all the columns (so as not to miss any of them out). If we look after the columns, it seems likely that the rows will look after themselves.
If we only plotted on each of the 25 rows, that would be 25 points in total. There are 40 columns, and so there would be at least 15 columns without any plotted points along their length. Thus there would be gaps in the line.
The columns are indexed by the counter X (as before) and we then calculate the value for the row which should correspond to that column. The row index is called Y (as before). If the column number is 7 (say), the equivalent row is $7 * S=4.375$. We plug these values of X and Y into the same formula as before (i.e. $1024+\mathrm{X}+$ $\mathrm{Y}^{\star} 40$ ).
The program is RUN. There is, however, no line from the top left corner to the bottom right corner. Instead, there is a regular pattern of dots/chequers all over the screen.
I made a mistake.
The mistake must be in the way in which the $Y$ co-ordinate value is calculated. This is easy to remedy: we do not use the fractional value of $Y$ in calculating the location in memory, we should use the Y value rounded to the nearest whole number. If $Y$ is 4.375 then it is rounded to 4 . The number 4.375 means that the point lies somewhere on row 4 , and if the number was 4.75 this would mean that the point lay on row 5 .
The modified version of this program (A MODIFIED LINE OF BLOCKS) works, and the difference comes in line 140. In place of
where $\operatorname{INT}(\mathrm{Y}+.5)$ rounds Y to the nearest whole

## number.

If the fractional part is .5 or over, adding .5 makes the whole number part go over into the next whole number: INTing this new number then effectively rounds to the whole number above the original number.
If the fractional part is less than .5 , to add .5 does not change the whole number part: INT rounds down in this case.
Running the modified version gives the straight line we want, diagonally, from corner to corner. Examining the "line" shows that sometimes there is more than one chequer on each row. The line which has been drawn is not truly diagonal, it is a set of little horizontal lines (of two or more adjacent chequers on a row) plus individual chequers.
All lines on a computer are like this when you look at them under magnification, the finer lines you see with high resolution graphics are nothing more than finer examples of the line of chequers you have drawn. Next month we will progress a bit further with the theory of drawing straight lines.

## "Leaves the Atari, Dras

## and Lynx




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[^5]
# gon, Commodore 64 for dead." 


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\section*{Spectrum sound}

THE SINCLAIR SPECTRUM, although wonderful in many other respects, does sall little when it comes is single channel, whe effects sound chip used for noise, and the range of earticucapacity
you can get is therefore a little larly from BASIC. There is only least everyone win the exquisitely BASIC, but As explained in this is BEEP. BEEP remember. An (Chapter 19) thisecify the type ar
written manual
figures to spe in the trade is followed by figures known in the these are ks". sound, these ameters". "f the tone in seconds, The first is the duration specifying the pitch. the second is a't made quite from - 60 to +69 . Although it isn number can run fisible. In practice Fractional values are pout -40 to +50 of this only the notes from aboul integer value all convincing.) Ents a tone on the thus middle \(C\) parameter represatic musical scale,
Western chrom 12 is the C an
While Wester piano is note zero,
on the pratement might be octave above. A valia
BEEP \(0.25,3\) BEEP \(0.25,3\) D played for a quarter is what This is fine for making music, But what about the manual primarily caters need for games, ifferthe special
warbles, buzes and zaps that mak warbles, buzzlayer's motivation. The interpreter is ence to in BASIC it isn to running a whole
Well in slow when it comes to which is the usual mectry such short tones
for making sound as
which produces a kind of rising and falling ripple which produces a kind
when RUN. Experimenting with different durations and tons. other noises.
To get the need necssary
gor
Z 80
machinevincing effects, prograry, which is outside the vincing really necessaffe it to say that you very scope of this article. sy outputting a brency. It is also get white noise, gh, random frequency. fast short click little advanced,
possible, but sound. possmore channels of sore's a short routine simpler. If In the meantime, here's programming simpler. you might your Spectrum music on the machine, you mise you're entering with putting ining, and all those get a bit bors - it's time-consum.
statements numeric values are


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\section*{LEVEL 9 COMPUTING}

Dept K， 229 Hughenden Road，High Wycombe，Bucks HP13 5PG

Adventures whic response time，are spectacular in the amount of detail and number of locations，and are available to cassette owners ．．Simply smashing！＂－Soft，Sept 83 ＂Colossal Adventure is included in Practical Computing＇s top ten in Practical Computing s top ten games choice for 1983：＂Poetic
and tough as hell．＂\(\quad\)－PC，Dec 83 ＂To sum up，Adventure Quest is a wonderful program，fast，exciting and challenging．If you like adventures then this one is for you＂－NILUG issue 1.3
＂Dungeon Adventure is
recommended．With more than 200 locations， 700 messages and 100 objects it will tease and delight！＇
－Educational Computing，Nov 83 ＂Snowball．．As in all Level 9＇s adventures，the real pleasure comes not from scoring points but in exploring the world in which the game is set and learning about its denziens ．．this program goes to denziens．．this progra that the mental pictures prove that the mental picture conjured up by a good textual adventure can be lar more vivid than the graphics available on home computers．

Which Micro？，Feb 84 ＂Lords of Time．This program writen by newcomer Sue Gazzard joins my favourite series and is an extremely good addition to Level 9 ＇s consistently good catalogue As we have come to expect from Level 9，the program is executed with wonderful style－none of those boring＂You can＇t do that＂ those boring＂You
messages！Highly recommended．＂

＊Pick your own team for each match．\(\star\) As many seasons as you like \(\star\) Managerial rating \(\star 7\) skill levels \(\star\) Save game facility． 4 ddictive ＊ZX81 Chart Home Computing Weekly 1．8．83 and \(1 / 11 / 83\) ．

Comments about the game from press and our customers． COTBALL MANAGER is the best game I have yet seen on the pectrum and my personal favourite of all the games on any micro．．．To the ordinary person it is an excellent view of what can be done in the field of computer games．
The crowning glory of this game is the short set pieces of match highlights which show little stick men running around a pitch，shooting，defending and scoring．It is a compulsive game bun palay，whill be grateful to know that there is a＇save to tape＇option．FOOTBALL MANAGER has everything it could．．．The originator，Addict





\section*{Money Spectrum}

LS 6 LET SC＝0：GO TO 300 LET SPE 10 LET \(5 C=0:\) LET \(11=3:\) LET \(5 P\)

MONEY is an easy to enter arcade game from Karl Brazier of Southampton．Although written in Basicit is as fast as some machine－ code games，and will certainly test your
reactions．


11 INK 7 FAFER 7：INK 1：＂SCOFE 0 HIGH：0 ENERGY：1000＂FFIN 20 FOFE 23659，22：FFINT AT \(n\) ， T＂＂：FOF 17－ 1 ：＂：NEXT n：FFINT＂ ：FAFEF \(O\)

25 FOFE 23659,2 LET \(x x=15:\) LET 26 LET enr \(=999\) ：
\(y y=10 \quad\) LET rer＝5pe：LET \(w W=5\)
\(\begin{aligned} & 27 \text { LET } \mathrm{O} \text { DIM（5）：DIM } \square(5): F O F ~ \\ & 3\end{aligned}=1\)
TO WW \(a(n)=F N D * 29+1: L E T \quad \square(\pi)\)
\(\leq 1\) LET \(a(n)=F N D * 29+1 * 2\)
\(=F I N D * 19+2\) FFINT FAFEF 7：INK 1 ：AT 0,6
22 FFINT FAFER O， 2,28 ：enr，
：sc：AT AET enr＝enr－1：NEXT \(\pi\)（1）：＂＂

：INF 5：AT \(A T\)（4）a（4）：＂事＂：AT \(\square(\)
a（ذ）＂＂事＂AT
3 FFINT AT 0，O：＂＂LET \(\angle=F E E K\) 36 FOF \(t=1\) TD \(5 P E: 5\) AND \(x x \leq 30\)
25660 LET \(x x=x x+(1)\)
\(1-(L=54\) AND \(x \times>1)\) \(\leq 7\) LET \(y y=y y+(u=50\)
\((u=57\) AND \(y y \geqslant 2)\) （Ll \(=5\) IF enr 80 THEN GO TO 300 LEFEE 39 LET Enr＝enr－1．AT YY，＊x：＂＂：\(F\) N本（YY，XX）：FRINT AT \(1:\) AT \(0,6: S C: A T O, 16\) ； AFEF 7： 7 ： 28 ：EnT，THEN GO SUB 110 hi：AT 0，28：En＂THEN GO SUB 110 5 FRINT AT YY， \(2 \times\)（1）：＂＂AT 90 FFiINT AT \(b(1), a(1):\) AT \(b(\Sigma), a(3): " A T\) （2），a（2）：＂＂：ATAT b（5），a（5）：＂ \(b(4), a(4):\) 100 GO TO SO
 ：FFINT AT YY，BEEF ． 44 ，4：BEEF 4：EEEF O1，M：BEEF \(W W=W W-1\) ． 02, －4：NEXT \(I F\) THEN FOF \(n=0\) TO 111 IF \(m=0\) TO 7：FFINT AT \(Y Y, x \times\) ： 4：FOR \(m=0\) ：EEEF：OO9，\(m\)－n：NEXT \(m\) ：NEXT ח：LET \(1 i=1 i-1:\) PRINT AT 10,10 ：＂LIVES LEFT：＂1． 1 ：FOF：\(n=1\) TO 10：EEEF 05，T：NEXT＂：IF 1 AT \(10,10: \quad\) TO 125
\(=0\) THEN GO TO


> 112 IF wW \(>1\) THEN FETUFN 120 IF wW=1 THEN GO TO 200 125 GO TO

125 GO TO 300
200 FRINT AT 10，11：＂WELL DONE
235 FOF \(n=50\) TO 1 STEF－ 3 ：BEEF －005，n：NEXT 1
240 FOFE 2उ659，0：FOF \(n=2\) TO 22
：FRINT AT N，1：FAFER 4：＂＂：NEXT 7：FOOFE 23659，2
 245 FOKE 23659，0 STEF－1：FFINT AT \(n, 1: " .122\) TO 2
```

FOKE 23659,2 : NEXT ח:
FOKE 23659，2＂：NEXT ח：

``` 250 FFIINT AT
rer－spe＋2：LET spe＝spe－1 255 FOR \(n=1\) Spe＝spe－ 1
－ \(005, n\) ：NEXT \(n\) SO STEF उ：EEEF 260 FFIINT AT 10，12：＂

265 LET WW＝5
266 LET \(5=5=5 C+100\)
270 GO TO \(\mathbf{3 O}\)
300 FOF \(n=0\) TO 50 STEF \(3:\) EEEF ＂OOB，n：NEXT ח：CLS：IF schi T
305 FOR \(N=1\)
306 INE तI FIFINT AT 1，0：
उ10 FFIINT＂
उ11 FRINT

\section*{312 FFINT}

314 FRINT
315 FFINT
316 INE 8－n：FRINT
30 FFINT
E21 FRINT
32 FIRINT
324 FRTNT＂
325 FFIINT＂
3 BO FRINT AT 12,20 EREGGHT 1．I NK 5：FLASH 1：＂BY＂FLASH O：TAE ER＂INVERSE 1：＂ド，EFAZI

540 NEXT 1
玉41 INK゙ 6
345 FRINT AT 15,\(0 ; "\) STEEF THE M AN［ ］WITH THE＂．．＂SINCIAIF M
OYSTICK OF THE KEEYS＂SIA OYSTICK OF THE K゙EYS＂
З46 FRINT＂＂
．DOWN 9．．UF＂＂6．＂LEFT 7．．FIGHT 8


350 FFITNT NF゙ 5：＂韦＂INF E＂』£1：AT INK
 IS5 FFIINT INE FND＊6＋IN AT 7,\(22 ; ":\) AT FNDD＊6＋1：FLASH 1： 9，22：＂＂：AT \(10,2,2\), ＂ANYESS＂：AT ，22：＂＂＂AT 10，22；＂ANY KEY＂：AT 11
＂OO BEEF ．OS，FND＊SO：IF INKEY：\(=\)
\(" "\) THEN GO TO FIND
370 CLS
400 FOR ：GO TO 10
USF：＂a＂＋\(n=0\) TO 1 ：READ a FORE
Th：FETUFN：BEEF：OOB，a／4：NEX 410 DATA 170
\(70,85,24,60,24,85,170,85,170,85,1\)
\(0,126,219,219,255,90,24,36,36,6\)
\(8,81,8161,195,126,60,0,7\) \(8,81,81,81,81,78,0\)
9000 SAVE
9010 FAVE＂Money Man＂LINE 1
rify：Money Man＂：UEFIFY＂Mape To Ve an＂：Fifint＂The Fiecordin＂Money M ＂：FAUSE 5OO：RUN


\section*{Spectrum tips}

CARL Radcliff of Roundhay in West Yorkshire has sent in a list of tips that will be very useful for other Spectrum owners.
POKE 23756,0 :changes the lowest line in a POKE 23756,0 . Basic program to line number zero and makes it impossible to edit.
eg. 1 REM COMPUTER CHOICE IS MAGIC now if you enter POKE 23756,0 this becomes: O REM COMPUTER and such a technique this is now unediseful for a copyright message would be very use programs. POKE 23658,8
turns the caps-lock on. This is useful if you write a program using a lot of INPUT statements as you will know that every letter input is a capital.
POKE 23658,0 : turns caps-lock off.
POKE \(23613, \operatorname{PEEK}(23730)-5\) :
will disable the break key. The next routine is handy for programmers because it will print out the nubracts the amount memory remaining. for the sound and high of memory reserved for resolution graphics, etc.
10 PRINT "BYTES FREE \(=\) " \(\quad 65536\)-USR 7962

\section*{Oric Art}


\section*{Beam}正

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Based on an allophone system you can easily program any word, sentence or phrase and incorporate speech into your software games. Fully tested and guaranteed.
Complete with demonstration cassette and full instructions.


\section*{UPGRADE YOUR ZX SPECTRUM NOW!}

The CHEETAH 32K Rampack simply plugs into the user port at the rear of your computer and increases the memory instantly to 48 K .
- Fully compatible with all accessories via rear edge connector.
- No need to open computer and invalidate guarantee.
- Why send your computer away and wait weeks for upgrade.
- Fully cased, tested and guaranteed.

\section*{Now make your SPECTRUM} and ZX81 Talk!

The CHEETAH "Sweet Talker" just plugs into the back of the computer using the existing power supply. Based on an allophone system you can easily program any word, sentence or phrase. Fully cased, tested, guaranteed and compatible with all accessories via rear edge connector. Complete with demonstration cassette and full instructions. No more lonely nights!


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16K Rampack for ZX81
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£44.75
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\title{
ARCADE ACTION AND 3D SPACE ADVENTURE
}

\section*{The Guardian} You are at the Gateway to the Anti-Matter World of Migon do you dare enter will you survive?


ARCADE ACTION FOR SPECTRUM 4SK


NAME ADDRESS

PLEASE SEND ME
BLADE ALLEY \(\square\) SPECTRUM \(48 \mathrm{KK} £ 5.95\) THE GUARDIAN \(\square\) SPECTRUM \(48 \mathrm{KK} £ 4.95\) IENCLOSE TOTAL REMITTANCE OF.
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A fast action machine code space game in which you defend your position as Galaxy Warlord against attacking enemy starships. Both your patrol-ship and rockets are steerable. The enemy never seem to give up! Full colour action graphics and sound for
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\text { fust } \quad \text { ค.... } £ 5.50
\]

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(For any ZX Spectrum)
The "famous" arcade maze game with fast machine code action, excellent graphics, colour and sound. Eat-up all the dots before the Ghosts eat you, or beat them to an energy pill which w
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An excellent educational program for 6-9 year olds The fun way to learn and practice Addition, Suotraction, Multiplication and Division. Mistakes
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(For 48 K Spectrum only)
One of the original computer space games, but this program has many up-dated features normally only found on larger computer versions. Test yourself as Starship Commander as your mission takes you to the outer reaches of the Galaxy to Starship and yourself! Excellent value at R.в.р. \(£ 4,95\)

\section*{SPECTIPEDE}

For any ZX Spectrum)
Enjoy the thrill of this full machine code arcade game Battle to keep the Spectipede at bay but watch out for a very unpredictable spider which is out to get you score feature.
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\section*{OTHER COMPUTERS?}

Send S.A.E. for a full list of our growing range of software available for ZX81 and now ORIC-1Computers.

AVAILABLE FROM LEADING DEALERS NATIONWIDE


\section*{いう.}

There was an AMAZING, LONG LETTER from idiot of the month Gary Watson, of the settlement Chester-le-Street on the planet Codurham. Gormless Gary has just bought a ZX Spectrum, and he says he has encountered two tedious and quite annoying problems (and he doesn't mean Bolt-neck and Marv).

My tedious and annoying problem is that Gary can't read.
I, and most other super-intelligent beings, thought that despite their extreme lack of manners Spectrums had a good cassette system. The ZX-81 was about as good at loading as politicians are at governing, but the Speccy was a vast improvement.
Gary says, "I didn't pay much attention to the much publicised criticism of the ZX Spectrum tapeload problem . . .": neither does anybody else, there isn't one. Our correspondent (SiRob used another word instead of "correspondent", but
we had to alter it. ED) finds it literally impossible to Save, Verify and Load a program successfully.
Commercial games load without any problem, yet gritty Gary says, "I have followed the instruction manual supplied with the computer very carefully and still cannot save a program."
Genius that I am, I will tell you the answer. Read the manual properly.
The manual says to read the basic instructions on how to LOAD, SAVE and VERIFY, that are in the Introductory booklet. In the Introductory booklet it says that if there are saving problems to disconnect the Ear socket. Problem solved!
Gary's second problem is with user-defined graphics: he can't get them to work. The only possible solution I can think of, and usually I can think of a million, is that he is confusing uppercase letters with lowercase letters. The chapter in the Spectrum manual is (in this particular case) BAD.
\begin{tabular}{l} 
Send your \\
problems to: \\
SHRob, \\
Computer \\
Choice, \\
Quadrant \\
House, \\
The \\
Quadrant, \\
Sutton, \\
Surrey. \\
\hline
\end{tabular}


Just to prove he's the fool we always thought he was: the FIRST STUPID WASTE OF TIME comes from Bolt-neck, of the Thirteenth Coffin on the Left, The Graveyard, Dankwood. 'I have a television with Ceefax. On page 700 it says you can load programs onto your computer. How do I do it?", Easy. There are only two things that you need to do (well more than two, but I have been told not to be rude, fat head).
First, buy an Acorn BBC Model B computer.
Two, buy a special adaptor for \(£ 225\).
No, you cannot also use the Acorn Electron computer, because the Electron does not have a teletext mode (one reason why it's cheaper). This system only works for the BBC computer.

Finally a SOUNDLESS SOUND program from Chris-
topher Hill of Crewkerne, topher Hill of Crewkersher
Somerset. Chatty Christopher Somerset. a cassette tape, con-
sends me taining a program or the a sorry 64. Christopher to tell of returned machstory he is now on his third com-
ines: puter (and he's not going to purget it either). Cheerful Christopher decided to
from the CBM
64 enter a prograll Piano Keyboard,
Manual called Manual callod I found that the pro-
"To my horro
work properly, it gram did not work properly, it seemed to be STUCK! with the sends along the cassette with the program, and asks for us to return the cassette when wer. Cheeky Christopher
Two comments.

\title{
Explore the Micr at the NEC \(B\)
}


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arocomputer Age
} [Birmingham

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\title{
New-Sinclair QL There's no comparison chart,le
}


\section*{\(£ 399\)}

\title{
because there's no comparison!
}

\section*{Advanced new friendly language - Sinclair SuperBASIC}

The new Sinclair SuperBASIC combines the familiarity of BASIC with a number of major developments which allow the QL's full power to be exploited.

Unlike conventional BASIC, its procedure facility allows code to be written in clearly-defined blocks; extendability allows new procedures to be added which will work in exactly the same way as the command procedures built into the ROM; and its constant execution speed means that SuperBASIC does not get slower as programs get larger.
\(2 \times\) Local area network

Microdrive extension slot

\section*{Two 100K microdrives built in}

The Microdrives for the Sinclair QL are identical in principle to the popular and proven ZX Microdrives, but give increased capacity (at least 100K bytes each) and a faster datatransfer rate. Typical access speed is 3.5 seconds, and loading is at up to 15 K bytes per second. The sinclair QL has two built-in Microdrives. If required, a further six units can be connected.

Four blank cartridges are supplied with the machine.

\section*{Included - superb professional software}

The suite of four programs is written by Psion specially for the QL and incorporates many major developments. All programs use full colour, and data is transportable from one to another. (For example, figures can be transferred from spreadsheet to graphics for an instant visual presentation.)

\section*{Word-processing}


Certain to set a new standard of excellence, QL Quill uses the power of the QL to show on the screen exactly what you key in, and to print out exactly what you see on the screen.

A beginner can be using QL Quill for word-processing within minutes.

QL Quill brings you all the facilities of a very advanced wordprocessing package.

Spreadsheet


QL Abacus makes simultaneous calculations and 'what if' modelconstruction easier than they've ever been. Sample applications are provided, including budget-planning and cash-flow analysis. QL Abacus allows you to refer to rows, columns and cells by names, not just letters and numbers. Function keys can be assigned to change a variable and carry out a complete 'what if' calculation with a single key-stroke.

\section*{Business graphics}


QL Easel is a high-resolution colour program so easy to use you probably won't refer to the manual! It handles anything from lines, shaded curves or histograms to overlapping or stacked bars or pie charts. QL Easel does not require you to format your display before entering data; it handles design and scaling automatically or under your control. Text can be added and altered as simply as data

\section*{Database management}


QL Archive is a very powerful filing system which sets new standards, using a language even simpler than BASIC. It combines ease of use for simple applications - such as card indices with huge power as a multi-file data processor.

An easy-to-use labelling facility means that you don't have to ask for your file by its full name - a few letters are enough.

\section*{New - the Sinclair QLUB}

The QLUB is the QL Users Bureau. Membership is open to all QL owners. For an annual subscription of \(£ 35\), QLUB members receive one free update to each of the four programs supplied with the QL, and six bi-monthly newsletters. Sinclair has also made exclusive arrangements for QLUB members to obtain software assistance on QL Quill, Abacus, Archive or Easel by writing to Psion.

\section*{The Sinclair QL challenge}

If you're seriously considering any other computer, post the coupon for a blow-by-blow comparison. We'll take a published comparison chart for the machine you're considering (not one we've created ourselves) and give you the Sinclair QL figures, detail by detail.

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So book your place now by sending for an advance ticket at reduced cost.
But don't forget the date: ALLY PALLY 28th APRIL 1984.
See you there.

\section*{SEND TODAY FOR REDUCED PRICE ADVANCE TICKETS!}

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NYOR SPECTRU
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Trickstick turns your Spectrum into the most sophisticated games machine in the world. Your fingers rest on the Trickstick's six sensitive pads (four directions and two fire buttons) and the harder you press the faster you go or the harder you turn.

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\section*{TRICKSTICK- \\ The revolution th} ordinary joysticks

\title{
THE 80K SPECTRUM - E57.50
}

Upgrade your \(16 k\) spectrum to a full 80 k with the SP8O - a 6ak expansion kit giving two 32 k pages above address 32767 Not recommended for beginners, but ideal for the serious programmer Pages are switched using software instructions only, and an LED indicates which page you are on. The other page is isolated from the system, but retains all its information until switched back.

The SP80 simply plugs into the sockets in the 16 K spectrum. Full fitting instructions are provided. It is easy to fit and no soldering is required.

see \(48 / 80\) FORTH for another angle.

\section*{UPGRADE YOUR ISSUE 2 OR 3 SPECTRUM FOR JUST E23 AND GET A EA. 50 COPY OF BEYOND HORIZONS ABSOLUTELY FREE}

The SPA8 simply plugs into the sockets provided by sinclair in your spectrum. Easy to fit, full instructions provided and no soidering. Fits both issue 2 and issue 3 machines and gives you a
standard 48 k spectrum. And no other expansion kit allows you to upgrade later to the 80k spectrum. Over \(20,00016 \mathrm{~K}\) spectrum owners have already upgraded with the SP48. join them.

And you get a free COPY of BEYOND HORIZONS, so there's vet another angle to look at.
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ong range, over the horizon sensors. Tuned to the plasma output of Seiddab hover fighters.


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[^3]:    3720 NEXT $\quad 1$
    3725 LET $z=z-1$
    3750 LET $w=w=w(1$ TO z）
    3740 FETURIN
    3996 FEM
    3997 FEM
    3998 FEM Initialise
    3999 REM
    4000 LET $n s=17$ ：LET $\mathrm{se}=2$
    4005 DIM a $=(2,50,10)$
    4007 DIM $\mathrm{n}^{2}(2,50,10)$
    4010 DIM U丰（2，50，10）
    4012 DIM V $=(2,50,10)$
    4014 DIM b家 $(2,50,10)$
    4016 LET $y=$ $=$＂AEIOU＂
    4018 DIM $W(2,5):$ LET $W=="$
    4020 FOF $x=1$ TO 2
    4025 LET $z=0$
    4030 LET $z=z+1$
    4040 READ $w=$ if：$w==" / "$ THEN GO TO 4100
    4050 LET a⿻三丨 $(x, z)=w ⿻ 三 丨$
    4060 GO TO 4030
    4100 LET $w(x, 1)=z-2$ ：LET $z=0$
    4110 LET $z=z+1$ ：READ $w+$ ：IF $w=="$
    THEN GO TO 4200
    4130 LET nま $(x, z)=W$
    4150 GO TO 4110
    4200 LET $w(x, 2)=z-2:$ LET $z=0$
    4210 LET $z=z+1$ ：READ $w ⿻ 三 丨$
    ／＂THEN GO TO 4300
    4230 LET U丰（x，z）＝w w
    4250 GO TO 4210
    4300 LET $w(x, 3)=z-2:$ LET $z=0$
    4．310 LET $z=z+1$ ：FEAD $w=$ ：IF $w \neq="$
    THEN GO TO 4400
    4330 LET $\vee ⿻=(x, z)=w ⿻ 三 丨$
    4350 GO TO 4310
    4400 LET $w(x, 4)=z-2$ ：LET $z=0$
    4410 LET $z=z+1$ ：READ $w ⿻ 三 丨=1$ ：IF $w=="$
    THEN GO TO 4500
    4430 LET bき $(x, z)=w *$
    4450 GO TO 4410
    4500 LET $w(x, 5)=z-2$
    4510 NEXT $\times$
    4900 RETUFN
    4996 REM
    4997 FEM
    4998 FEM 1 Syllable Words
    4999 FEM
    5000 FEM Adjectives
    5010 DATA＂RED＂，＂GREEN＂，＂OLD＂，＂Y OUNG＂，＂STILL＂，＂EROWN＂，＂ELACK＂，＂W HITE＂，＂WISE＂，＂FAT＂
    5020 DATA＂THIN＂，＂GREY＂＂HIGH＂， WIDE＂，＂DEEF＂，＂DEAD＂，＂WET＂，＂WILD＂ ，＂ELUE＂，＂SOFT＂，＂FICH＂

[^4]:    $1040 \mathrm{X}=\mathrm{INT}(1+\mathrm{RND}(1) * \operatorname{NW}(55,5))$
    $1050 \mathrm{SL}=\mathrm{SL}+55$
    1060 S $=$＝S + ＋AV本（SS，X）＋＂，＂
    1070 GOSUB 3000
    1187 REM ADVERB？
    
    1195 IF AP＜＞2 GOTO 1220
    $1200 \mathrm{SS}=\mathrm{INT}(2+\mathrm{FND}(1) * 2)$
    $1210 \mathrm{X}=\operatorname{INT}(1+\operatorname{RND}(1) * \operatorname{NW}(5 S, 5))$
    
    1217 REM VERB
    $1220 \mathrm{SS}=\mathrm{INT}(1+\mathrm{FND}(1) * 3)$
    $1230 \mathrm{X}=\mathrm{INT}(1+\mathrm{RND}(1) * \operatorname{NW}(\mathrm{SS}, 3))$
    1240 SL＝SL＋SS：S事 $=S+V 1(S S, X)+" S "$
    1245 REM ADVERB？
    1250 IF AF＜＞3 GOTO 1300
    $12605 S=$ INT $(2+$ FiND（1）＊2）
    $1270 x=\operatorname{INT}(1+\operatorname{FiND}(1) * \operatorname{NW}(55,5))$
    
    1300 RETURN
    1996 REM
    1997 REM
    1998 REM SENTENCE TYPE 2
    1999 REM
    2000 S $=="$＂：C $=="$＂：SI＿＝0
    2005 REM INITIAL ADVERB？
    $2010 \mathrm{AF}=\mathrm{INT}(1+\mathrm{FND}(1) * 8)$
    2020 IF AF＞1 GOTO 2070
    2030 SS＝INT（2＋FND（1）＊2）
    $2040 \mathrm{X}=\mathrm{INT}(1+\mathrm{RND}(1) * \mathrm{NW}(\mathrm{SS}, 5))$
    2050 SL＝SL＋SS
    2060 S $=$＝S + ＋AV $(5 S, x)+"$ ，
    2070 GOSUB 3000
    
    2090 IF $\mathrm{AF}<>2$ GOTO 2130
    $2100 \mathrm{SS}=\mathrm{INT}(2+\operatorname{RND}(1) * 2)$
    $2110 \mathrm{x}=\mathrm{INT}(1+\mathrm{FND}(1) * \operatorname{NW}(5 S, 5))$
    
    2130 FEM VERB

[^5]:    Spectravideo SV 318: Memory - 32K ROM expandable to 96 K , 32 K RAM expandable to 144 K : Keyboard - calculator type, 71 keys, 10 functionkeys, builtin joystick/cursor control: Graphics - 16 colours, $256 \times 192$ high resolution graphics, 32 sprites: Sound -3 channels, 8 octaves perchannel: CP/M* compatibility - over3000 existing software packages: Storage - cassettedrive, 256 K disc drive capacity: Suggested retail price - $£ 186$.

    Spectrovideo SV 328: Memory - 32K ROM expandable to $96 \mathrm{~K}, 80 \mathrm{~K}$ RAM expandable to 144K: Keyboard - full word processor type, 87 keys, 10 functionkeys, builtin cursor control: Graphics - 16 colours, $256 \times 192$ high resolution graphics, 32 sprites: Sound -3 channels, 8 octaves perchannel: CP/M* compatibility - over3000 existing software packages: Storage - cassettedrive,256K disc drive capacity: Suggested retail price - £262.

